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JOINT FORCES STAFF COLLEGE
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**Maritime NORAD: Setting a Course for Success in Joint, Interagency, and
Bi-National Maritime Homeland Security and Defense**

by

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

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05 April 2007

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ABSTRACT

Since 9/11 much work has been done to improve our understanding of maritime traffic and activity in the coastal zone and approaches to North America. In May 2006 when the North American Aerospace Defense Command (NORAD) agreement was renewed by the U.S. and Canada, a maritime warning component was included. Since 1958 NORAD has provided the situational awareness of aerospace activity and homeland defense command and control that needs to be established and organized for the maritime environment. The new maritime component of NORAD provides an excellent opportunity to provide a comprehensive solution to the management of maritime homeland security (MHLS) and maritime homeland defense (MHL D). Numerous departments, services, agencies and at least one international partner, Canada, have a primary stake in this effort. Improving MDA and developing MHL D and MHLS procedures is an ongoing national priority for both the U.S. and Canada and will benefit from the example of NORAD and its almost fifty years of aerospace defense. However, the maritime warning mission may be even more complex because of the nature and vast scope of maritime traffic and activity. To achieve success, NORAD needs to manage MHLS and MHL D command and control together, oversee the synchronization of North American MDA efforts, and utilize a flexible, interagency organization model, to coordinate operations and ensure seamless command and control.

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I. INTRODUCTION

Non-state enemies could attempt to attack a wide range of targets including government facilities; commercial and financial systems; cultural and historical landmarks; food, water, and power supplies; and information, transport, and energy networks. They will employ unconventional means to penetrate homeland defenses and exploit the very nature of western societies – their openness – to attack their citizens, economic institutions, physical infrastructure and social fabric.

- *Quadrennial Defense Review Report*, February 6, 2006¹

Following the 11 September 2001 Al Qaeda terrorist attacks on the American homeland, the U.S. defense and security establishment took a hard look at the nation's vulnerability to further terrorist activity. In this assessment the maritime domain was immediately identified as a critical area of concern.² Securing the nation's coastal zone, encompassing 95,000 miles of coastline and 361 ports, presented an extraordinary and unprecedented challenge to those responsible for maritime homeland defense (MHL D) and maritime homeland security (MHLS).³ Further, the scope and complexity of maritime activity, which is absolutely essential to the economic health of the nation, includes 7,500 major commercial vessels making 51,000 port calls in the U.S. each year, a large commercial fishing fleet and nearly 13 million registered pleasure boats.⁴

¹ U.S. Department of Defense, *Quadrennial Defense Review Report* (6 February 2006), 24

² The maritime domain is defined as, "all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway..." The White House, *The National Strategy for Maritime Security* (September 2005), 1.

³ This total includes the Great Lakes and navigable rivers. U.S. Coast Guard, "Homeland Security Fact Card," <http://www.uscg.mil/hq/g-cp/comrel/factfile/Factcards/Homeland.htm> (accessed 25 August 2006).

⁴ U.S. House of Representatives, "Port Security: Shipping Containers." Committee on Transportation and Infrastructure. Subcommittee on Coast Guard and Maritime Transportation. 13 March 2002. www.house.gov/transportation/cgmt/03-13-02/03-13-02memo.html (accessed 25 August 2006) & U.S. Coast Guard, "Boating Statistics 2004," http://www.uscgboating.org/statistics/Boating_Statistics_2004.pdf (accessed 25 August 2006).

Fundamental to this maritime activity is free and easy access to coastal waters, harbors, key assets, critical infrastructure and major population centers. In the global economy of the 21st century, America's seaports are its primary link to the rest of the world. This same access is, of course, used by drug traffickers, migrant smugglers, and illegal fishing operations. Of greatest concern, this freedom of movement can be exploited by terrorists who wish to target densely populated urban areas like New York City or Seattle, Washington, or critical infrastructure such as the San Onofre nuclear power plant in Southern California or the bustling cruise ship terminal in Miami, Florida. As homeland security specialists Edward Feege and Scott C. Truver put it:

While posing a danger to America's social fabric, drug traffickers and illegal migrants do not represent the same type of threat as a lone terrorist or well-heeled terrorist group, particularly one that may be attempting to bring chemical, biological, radiological, or nuclear weapons of mass destruction and disruption onto U.S. soil. But smuggler ability to infiltrate U.S. borders *is* cause for serious concern. The routes and procedures they use offer similar opportunities for the more dangerous foes of the United States. Hence, it is becoming increasingly important that the United States be able to identify and stop anyone attempting to breach America's maritime sovereignty.⁵

Besides the threat posed by terrorists entering the country via maritime means, our maritime vulnerability was starkly outlined in the attacks on the USS *Cole* in Aden, Yemen, in October 2000 and on the French tanker *Limburg*, this time off the coast of Yemen two years later. Succinctly stated in *The National Strategy for Maritime Security*, "the United States Government must *facilitate the movement of desirable goods and people across our borders, while screening out dangerous people and material.*"⁶ Thus, security and defense leaders face the daunting challenge of balancing security measures

⁵ Edward Feege and Scott C. Truver, "Homeland Security: Implications for the Coast Guard" in Sam J. Tangredi, ed., *Globalization and Maritime Power* (Washington, DC: National Defense University Press, 2002), 442.

⁶ The White House, *The National Strategy for Maritime Security* (September 2005), 8.

with the freedom of movement and access that is central to legitimate commercial activity and demanded by the public enjoying legal maritime activities.

From the start, the definitions of MHL D and MHLS seemed clear, but created a seam that could aid terrorists by complicating and slowing response. MHLS was broadly defined as the “effort to prevent terrorist attacks within the United States, to reduce vulnerability to terrorism, and to minimize the damage and recover from attacks that do occur.” MHL D was defined as “the protection of U.S. territory, sovereignty, domestic population, and critical infrastructure against external threats and aggression.”⁷ The U.S. Coast Guard was designated as the lead federal agency for MHLS. In the Fall of 2002, the Department of Defense established U.S. Northern Command (NORTHCOM) to take the lead for MHL D matters. While many incidents can be intuitively categorized as either MHLS or MHL D rather easily, the difference between MHLS and MHL D are blurred when responsible services and agencies are actively responding to an identified threat or incident in real-world situations. A command and control organization and hierarchy was drawn up to support this, but in practice problems quickly presented themselves. For instance, processes are in place to determine whether events are defense or security situation, but seams remain in the transition of command and control from the U.S. Coast Guard to NORTHCOM if an event developed from MHLS to MHL D. In the same vein, the processes that port level or regional officials would take to request support from the Department of Defense are neither well known nor well practiced. Rather, these processes often depend on informal, locally developed arrangements or personality

⁷ Ronald O’Rourke, *Homeland Security: Navy Operations – Background and Issues for Congress* (Washington, DC: Congressional Research Service, 02 June 2005).

driven cooperation. These are good things, but this coordination needs to be institutionalized.

Since September 2001 and those initial vulnerability assessments, much work has been done to improve our understanding of maritime traffic and activity in the coastal zone and approaches to North America. When the effort to establish a comprehensive picture of maritime activity or Maritime Domain Awareness (MDA) began, myriad services and agencies were involved, including the Navy, Coast Guard and Bureau of Customs and Border Protection. Very little data was systematically collected and shared in a way that could provide the major players the MDA they needed in their work to secure the nation. A key element of MDA is a strong common operating picture providing a picture of friendly and notable hostile and neutral vessels. Routine access to key parts of the common operating picture was, and still is, available only to Department of Defense and Coast Guard commands. Some other useful pieces of the MDA puzzle, contained in a variety of computer systems and databases included commercial vessel advanced notices of arrival, Customs and Border Protection information on cargo manifests, the location of selected commercial fishing vessels, and a variety of protected or proprietary commercial information. Two more vital pieces of MDA are maritime intelligence and simply monitoring day to day activities in the ports and coastal areas searching for anomalous behavior. The problem was, and still is to a large extent, that this vital information is not gathered in one place nor available to all the key MHLS and MHLA organizations.

The early efforts to delineate MHLA and MHLS challenges and outline a way forward led to the development of key policy documents like *The National Strategy for*

Maritime Homeland Security, National Plan for Maritime Domain Awareness and Joint Publication 3-26 Homeland Security. However, plenty of work was still needed to unify MDA efforts, establish a maritime warning mechanism, and manage the seam between MHLS and MHLA. A number of officials including Assistant Secretary of Defense for Homeland Defense Paul McHale, Assistant Secretary of Homeland Security Admiral James Loy, Chief of Naval Operations Admiral Vern Clark, and Coast Guard Commandant Admiral Thomas Collins recognized this and, drawing on a long standing aerospace defense model, began discussing the possibility of a “maritime NORAD.”⁸

Finally, in May 2006 when the renewed North American Aerospace Defense Command (NORAD) agreement was announced by the U.S. and Canada, this discussion yielded results and a maritime warning component was included. Since 1958, NORAD has provided situational awareness and homeland defense coordination for the aerospace environment. Now a similar warning mechanism was to be established and organized for the maritime domain. However, because of the nature and vast scope of maritime traffic and activity, the maritime warning mission may be even more complex than the aerospace warning mission. While the stage was set for the new maritime warning mission at NORAD, the renewed agreement was not specific and left key questions unanswered, namely, how should this new element be organized and function and what resources, if any, would be made available for its implementation? Just as important, how should it interact and partner with the services and agencies already engaged in MHLS and MHLA activities? Also, notable in the agreement were the very limited

⁸ Christopher J. Castelli, “Loy: Officials Committed to Developing, Funding Maritime Awareness,” *Homeland Defense Watch*, Volume 3, Number 19 (20 September 2004). web.lexis-nexis.com (accessed 09 August 2006).

parameters of the initial maritime efforts at NORAD. As outlined, this was not a comprehensive program to improve MDA, create a dependable maritime warning process, and unify bi-national maritime security and defense command and control efforts. Was this the full effort or a first step in creating something that paralleled or even surpassed NORAD's air defense model? The start of the maritime mission at NORAD provides the U.S. and Canada a unique opportunity to address a number of critical security gaps in the maritime domain and truly contribute to the security and prosperity of both nations. As two bi-national security experts observed, "Our economic integration is our center of gravity, and the main reason that we need closer formal ties in the maritime domain."⁹

The maritime warning mission can improve MHLS and MHL D processes and coordination, but NORAD needs to develop beyond maritime warning. It needs to act as an information hub for comprehensive MDA and be a truly joint organization. The opportunity to unify the command and control process presented by the creation of a maritime component within NORAD is too great to pass up. At the same time, it must avoid being an additional layer of command or bureaucracy with little added value. Numerous departments, services, and agencies in both the U.S. and Canada have primary stakes in this effort. Improving MDA, establishing maritime warning, and further developing MHL D and MHLS procedures is an ongoing national priority for the U.S. and Canada and will benefit from NORAD's example of almost fifty years of coordinated, bi-national aerospace defense. In this thesis, I will work to demonstrate that to achieve success, NORAD needs to make a comprehensive maritime effort including treating

⁹ Robert Hogan and Biff Baker, "Need to Share: Information Exchange and NORAD's New Mission," *Proceedings of the Maritime Safety and Security Council* (Fall 2006), 72.

MHLS and MHL D together, integrating shared MDA and warning analysis, and utilizing a flexible, interagency organization model, to coordinate operations and ensure seamless command and control.

II. A BRIEF HISTORY OF NORAD: BI-NATIONAL DEFENSE PRECEDENTS AND LESSONS FOR MARITIME WARNING

Borne from close hemispheric defense cooperation between the United States and Canada during World War II, the North American Aerospace Defense Command is a bi-national military command that was formally established in 1958 to monitor and defend the air, and later space, above the U.S. and Canada. In the aftermath of World War II and early years of the Cold War, both nations realized the importance of continuing the coordinated defense of North America. Maintaining national sovereignty while partnering with a much bigger and more powerful neighbor was a frequent concern in Canada throughout NORAD's history. While policy and economic disagreements periodically manifested themselves, the security and prosperity of the U.S. and Canada was, and still is, inextricably interconnected. Despite these challenges the durable partnership prospered and came to be a central factor in defining the defense relationship between Canada and the U.S. in the second half of the twentieth century.¹⁰

NORAD was subject to stinging criticism following 9/11 for the failure to detect and respond to al Qaeda's use of domestic commercial airliners as guided missiles, something few defense planners saw as a serious possibility. In response the command adjusted its mission and broadened its focus to include internal threats. Thus, in addition to external air defense and space control, NORAD moved to meet the threat of civilian aircraft being used as weapons against population centers and critical infrastructure in North America. The basis of bi-national cooperation and focus on detection and warning

¹⁰ Donald Barry, "Managing Canada – U.S. Relations in the Post – 9/11 Era; Do We Need a Big Idea?" *Policy Paper on the Americas*, Volume XIV, Study 11 (Washington, DC: Center for Strategic and International Studies, November 2003), 1-2 and 10-11; and David B. Millar, "Canada and the United States – Defense Cooperation in U.S. Northern Command?" (Research paper, Air War College, 9 December 2002), 8-10.

of external and, now, internal aeronautical threats made NORAD a logical model for similar efforts in the maritime domain. When talk of a maritime warning mission at NORAD finally came to fruition in the 28 April 2006 renewal of the bi-national agreement, few were surprised. NORAD's history and development furnish key precedents and lessons learned for the establishment of the new maritime warning mission and broader maritime defense efforts. For the comprehensive maritime cooperation proposed in this thesis, NORAD's history and foundation provides invaluable insights, opportunities, and advantages.

NORAD's Origins and Operations During the Cold War

As war clouds gathered on the horizon before the start of World War II, both President Franklin Delano Roosevelt and Prime Minister William Lyon Mackenzie King recognized the special relationship between Canada and the United States. With common origins and shared values, cooperative defense of North America was a natural development during turbulent times. In 1940, only two years after those initial declarations of mutual interest, Canada and the U.S. created the Permanent Joint Board on Defense. Without a treaty or the exchange of diplomatic notes, Roosevelt and Mackenzie King established this permanent entity in Ogdensburg, New York, to explore bi-national defense of North America.¹¹ The Permanent Joint Board on Defense carried out much useful work during the war, including hemispheric defense planning and the assessment of a broad range of threats to North America. In 1946, the Permanent Joint

¹¹ Dwight N. Mason, "Canada and the Future of Continental Defense: A View from Washington," *Policy Paper on the Americas*, Volume XIV, Study 10 (Washington, DC: Center for Strategic and International Studies, September 2003), 1-2.

Board on Defense was augmented with the Military Cooperation Committee, an organization established to tackle growing work lists at a more junior level.

The conditions that led to the establishment of the Military Cooperation Committee in 1946 had evolved by 1958 to the point where very rapid air defense capability was needed because of the lethality of the weapons available to the Soviet Union and the speed at which they could be delivered. This situation led the United States and Canada to create a new bilateral organization – the North American Air (and later Aerospace) Command, or NORAD.¹²

On this fertile ground, close U.S. and Canadian cooperation in the air defense realm took root and grew into NORAD, which was declared operational in the late summer of 1957. Diplomatic notes were exchanged and the informal agreement received official sanction from the governments of Canada and the U.S. on 12 May 1958.¹³

Headquartered in Colorado Springs, Colorado, NORAD's genesis and initial focus addressed the need to detect and provide early warning of attacks by Soviet strategic bombers delivering nuclear weapons to targets in North America. NORAD provided an essential tripwire and protective shield for North America with a large radar network, anti-aircraft missiles and fighter-interceptors. After the Soviet launch of Sputnik in 1957 and the development of viable inter-continental ballistic missiles (ICBMs) in the 1960s, NORAD's mission expanded to include the detection of missile launches and warning of hostile ICBMs with trajectories indicating North American targets. As a result, NORAD's name was later changed from the North American *Air* Defense Command to the North American *Aerospace* Defense Command to reflect this fundamental broadening and reordering of the command's primary missions.

¹² Mason, 4.

¹³ D. Fraser Holman, *NORAD: In the New Millennium* (Toronto, Canada: Irwin Publishing), 12.

A strong bi-national organization had emerged that served to warn of missile threats and detect and deter hostile aircraft approaching North America. While contemporary technology limited the command's mission to warning of a Soviet ICBM attack rather than any kind of active defense, this warning was important to American nuclear strategy and homeland defense. In terms of meeting threats from Soviet bombers, a formidable capability to detect and deter or destroy enemy aircraft had been developed. NORAD was divided into three regions; the Alaskan NORAD Region headquartered at Elmendorf Air Force Base, Alaska; the Canadian NORAD Region based in Winnipeg, Manitoba; and the Continental NORAD Region at Tyndall Air Force Base, Florida. The Continental NORAD Region was further sub-divided into three sectors; the Northeast Air Defense Sector in Rome, New York, the Southeast Air Defense Sector at Tyndall Air Force Base, and the Western Air Defense Sector at McChord Air Force Base near Tacoma, Washington.¹⁴

When an aircraft threat was identified by the air warning center inside NORAD's Cheyenne Mountain Operations Center, commanders and key decision makers were consulted via conference call. The call initially included Cheyenne Mountain watch commanders, regional, and sector commanders. If required, it was expanded to include senior staff in Colorado Springs, executive leadership in the U.S. Department of Defense and Canadian Department of National Defence, and the President or Prime Minister. Typically, early in this process ready aircraft from the Royal Canadian Air Force or U.S. Air Force were launched to meet and further evaluate the threat. Had a situation ever escalated to require the destruction of a threatening aircraft, the national command

¹⁴ North American Aerospace Defense Command, "About Us," http://www.norad.mil/about_us.htm (accessed 6 October 2006).

authority of either Canada or the U.S. would have been consulted and, if authority was granted by civilian leaders, aircraft or air defense missile assets would have been directed to shoot down the enemy aircraft.

When the Cold War ended, NORAD remained focused on external aircraft and missile threats and the growing space control mission. However, many of the assets the

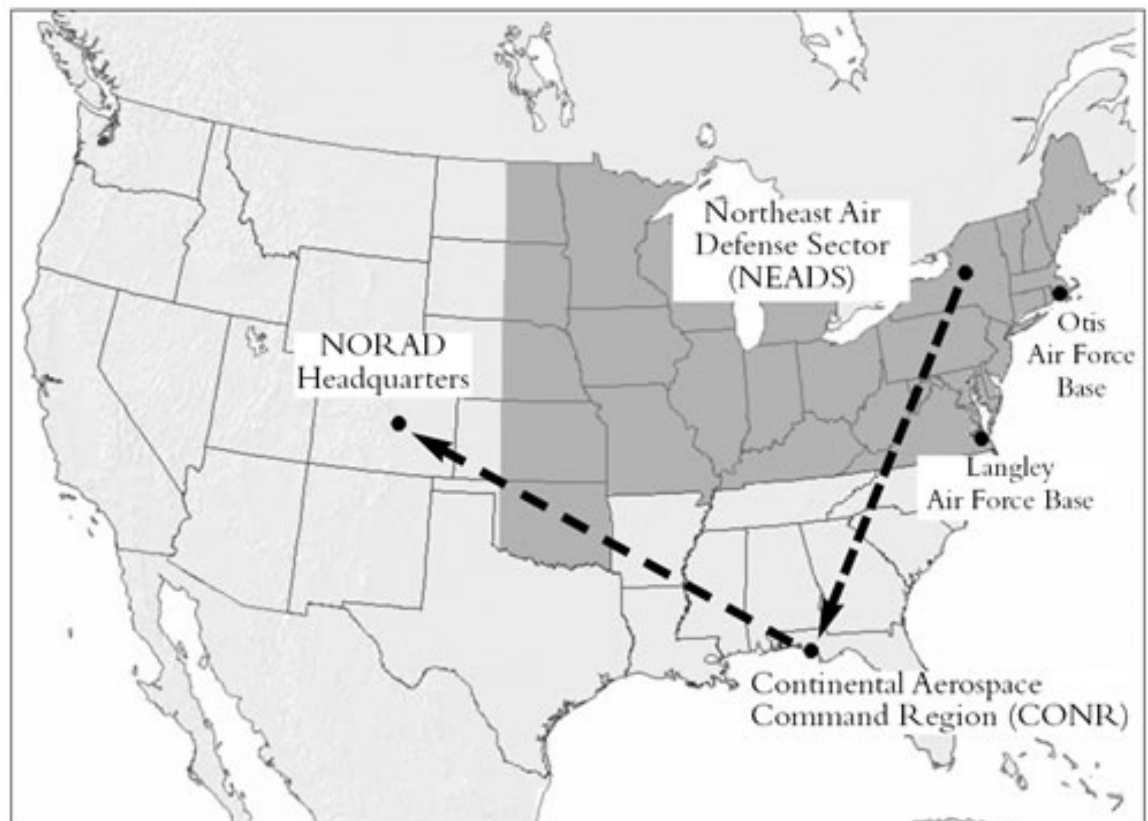


Figure 1. Command Relationship of Northeast Air Defense Sector to the Continental NORAD Region & NORAD Headquarters on 9/11¹⁵

command could call on to defend U.S. and Canadian airspace were deemed superfluous after the Soviet Union's collapse. These were cut as part of the post-Cold War peace

¹⁵ The National Commission on Terrorist Attacks Upon the United States, *The 9/11 Commission Report* (22 July 2004), 15.

dividend. As many as 2,000 ready fighter aircraft had been maintained at 26 sites during the Cold War. By 2001, the threat from hostile aircraft was believed so remote the number of fighters on strip alert for homeland defense had dwindled to just fourteen aircraft at seven bases for the entire continental U.S.¹⁶ On 9/11 the Northeast Air Defense Sector had just four armed planes ready for operations, two at Otis Air National Guard Base on Cape Cod and two at Langley Air Force Base in Hampton, Virginia.

9/11 – Response and Adaptation at NORAD

Like so many other defense and security organizations, the clear blue skies of 11 September 2001 ushered in a new era of unprecedented challenge and uncertainty for NORAD, while bringing an abrupt end to the false security of the post-Cold War era. The 1990s witnessed a series of attacks on U.S. and Western interests executed by Islamist terrorists. Security experts had been warning of asymmetric attacks on the U.S. for years, and al Qaeda leader Osama Bin Laden had issued numerous threats and *fatwas* against the U.S. and the West. Despite this, few defense leaders had made the leap from the distant and theoretical threat to the realization that attacks on the homeland could actually be operationalized by enemies of the West. Even when Islamic extremists succeeded in bombing the World Trade Center in New York City in 1993, the act was treated solely as a law enforcement issue rather than a national security challenge. Not surprisingly, none of the existing homeland defense or security entities, including NORAD, were ready to deal with the nineteen al Qaeda terrorists on United Airlines, Flight No. 11 and the other three hijacked airliners that terrible September morning.

¹⁶ Holman, 48; and The National Commission on Terrorist Attacks Upon the United States, 16-17.

On 9/11 NORAD was still positioned to monitor, detect, identify and intercept external aeronautical threats. Neither North Korea nor China had the long range aircraft capability to threaten North America and Russia's capabilities had atrophied significantly since the fall of the Soviet Union. The current threats were generally believed to be cruise missiles, aircraft delivering WMD, and other non-specific asymmetric threats originating outside of North America.¹⁷ Procedures for dealing with hijacked aircraft followed the old 1970s and 1980s paradigm of hijackers flying to Havana, Cuba, or Cairo, Egypt, and making political or monetary demands, but did not consider suicide attacks using the planes as crude guided missiles. Coordination with the Federal Aviation Administration would go no further than launching fighter aircraft to observe the hijacked airliner from several miles astern and provide support as required.¹⁸

Following 9/11 NORAD was criticized for perceived failures and took a hard look at its own processes to determine where the command could adapt and improve to meet these new challenges.¹⁹ Among the adjustments made by NORAD was a greater focus on internal aviation activity. This included identifying general aviation anomalies and establishing indicators in commercial aviation such as aircraft deviating from flight plans or failing to respond to communications from the Federal Aviation Administration (FAA) and Nav Canada, Canada's private, non-profit air traffic control organization. For better response to aviation threats, NORAD saw an increase from the late 1990s to over 100 ready fighter aircraft in the U.S. alone.²⁰ The establishment of NORTHCOM and

¹⁷ In 2000, retired Canadian Major General D. Fraser Holman, a past NORAD Deputy Commander, outlined a variety of threats, including cruise missiles launched from ships, to North America in his monograph on NORAD. Holman, 41-45.

¹⁸ The National Commission on Terrorist Attacks Upon the United States, 18.

¹⁹ Specific criticisms were noted in the 9/11 Commission Report. Ibid., 346, 352, 427-28.

²⁰ Christopher Bolkom, "Homeland Security: Defending U.S. Airspace," CRS Report for Congress, Congressional Research Service (6 June 2006), 1.

Canada Command by the U.S. and Canadian governments, respectively, put a strong command and control apparatus in place for homeland defense. While new organizations do not necessarily indicate an improvement in managing a given challenge, these new commands directly linked NORAD to a great deal of additional command and control capacity, including personnel resources, and a broader spectrum of operational capabilities.

A key element of NORAD's improved capability after 9/11 was its outreach and closer coordination with the FAA, Transport Canada, and Nav Canada. One senior FAA official outlined the coordination problem and the initial solution in a statement to the 9/11 Commission:

After 9/11 the most significant improvement needed was establishing a direct communications link between FAA facilities, DOD, and NORAD. We could no longer rely on communications to NORAD through our Headquarters or through the [National Military Command Center]. FAA air traffic personnel worked with DOD and other federal agencies to put in place procedures for direct communications between FAA and NORAD and law enforcement agencies. FAA assigned air traffic control personnel to NORAD facilities for direct support of air defense measures, and to support the newly established Domestic Events Net[work] (DEN).²¹

The Domestic Events Network became fully operational and, along with liaison officers at NORAD facilities, provided a virtual, real-time FAA and Nav Canada presence on the NORAD watch floor. The system also more closely linked other homeland security and defense organizations and the national command authority with NORAD.

With the prospective mothballing of Cheyenne Mountain, to be redesignated as the Alternative Command Center, the NORAD watch was moved and collocated with the

²¹ Monte R. Belger, Prepared Statement, The National Commission on Terrorist Attacks Upon the United States (17 June 2004), 4.

NORTHCOM joint operations center at Peterson Air Force Base in Colorado Springs.²² This recent move provided further opportunity for synergy with NORTHCOM, but will also challenge NORAD's leadership to maintain the focus and integrity of the NORAD watch in a very large and busy command center environment. There is little distinct separation between NORAD and NORTHCOM watchstanders. The move also raises concern about weakening NORAD's status as a separate command and becoming subsumed in the NORTHCOM organization. This trend toward seamlessness between NORAD and NORTHCOM is somewhat unremarkable from the U.S. perspective, but risks criticism from Canadian quarters and could be interpreted as contrary to the spirit and past practice of the NORAD agreement.²³

Lessons and Precedents for MHLS and MHL D

While there are surely distinctive challenges in creating and maintaining the maritime warning apparatus and broader maritime coordination at NORAD, the aeronautical warning mission and its adaptations following 9/11 provide some useful guideposts. The most obvious lesson for maritime warning may be the need for both external and internal focus when seeking to identify threats. Threats from outside the U.S. and Canada must be aggressively sought out, identified, and tracked through intelligence and surveillance. However, the aforementioned vastness of North America's maritime domain and the openness of the U.S. and Canadian free market economic

²² T. R. Reid, "Military to Idle NORAD Compound: Operations Will Move to Nearby Base, But Cold War Bunker to Stand Ready," *washingtonpost.com* (29 July 2006). <http://www.washingtonpost.com/wp-dyn/content/article/2006/07/28/AR2006072801617.html> (accessed 6 October 2006).

²³ Robert L. Hogan, CAPT, U.S. Navy, NORAD/NORTHCOM J-5, Chief, Maritime Division, Interview by author (1 November 2006, author's holdings).

system makes the development of threats within the borders of the U.S. and Canada very possible. Beyond tracking vessels in the mid-ocean, many hundreds of miles from the border, NORAD must monitor and search for indicators in the thousands of routine MHLS activities that take place within Canada and the U.S. every day. Anomalies in ordinary activities such as vessel escorts in the Strait of Juan de Fuca or lock inspections on the St. Lawrence Seaway must be reported to and considered by NORAD as the threat condition of the North American maritime domain is determined. This will require close coordination and information sharing with law enforcement and security officials in both the U.S. and Canada.

NORAD's history of providing aeronautical warning and command and control to the U.S. and Canada, in particular the lessons learned from 9/11, demonstrates the importance of bi-national *plus inter-agency* cooperation. A strong, bi-national and inter-agency organization is required when tackling a problem as complex as maritime warning. Just as in the aeronautical realm, U.S. and Canadian geographic, economic, and transportation interdependency make maritime domain awareness and response to identified threats explicitly bi-national. Equally important is the example provided by NORAD's close cooperation with civilian partners such as the FAA and Nav Canada. Whether physically present on watch or virtually connected, government entities and agencies such as Public Safety and Emergency Preparedness Canada, the Royal Canadian Mounted Police, Canadian Border Services Agency, Department of Homeland Security, Department of Justice, Bureau of Customs and Border Protection, Federal Bureau of Investigation (FBI), and others are integral to maritime domain awareness and layered

MHLS/MHLD response operations.²⁴ Communications systems such as the new Domestic Warning Network must be expanded to include maritime warning or mirrored for the maritime realm. The requirement at NORAD for robust interagency coordination, in addition to bi-national cooperation, is a key factor in the recommendation of a joint interagency taskforce-type (JIATF) organizational model for maritime warning and comprehensive command and control that will be discussed at length later in this thesis.

Two additional key takeaways from NORAD's aeronautical mission concern military organization and control of ready response forces. First, MHLS and MHLD, like the legacy air defense mission, are complex and require the monitoring of high volumes of vessel traffic and related maritime activities. In order to manage this volume in the air, routine command and control functions and first level analysis of indicators and threats are delegated to the three air defense regions and further distributed to the three air defense sectors within the busy U.S. Continental Air Defense Region. Similar regionalization needs to be implemented in the maritime realm. Related to regionalization is the command and control of military vessels, aircraft, and other capabilities needed for MHLS/MHLD response operations. NORAD has been assigned specific forces maintained at the ready for air defense missions through its Joint Forces Air Component Commander at Tyndall Air Force Base. A similar arrangement needs to be made, either directly by establishing a NORAD Joint Forces Maritime Component Commander (JFMCC), or through Canada Command and NORTHCOM. The key issue is having a broad spectrum of ready capability identified and assigned to NORAD, or supporting commands, for rapid response to maritime threats. Specific recommendations

²⁴ Established in 2003, Public Safety and Emergency Preparedness Canada is Canada's counterpart to the U.S. Department of Homeland Security.

on organization and command and control of response forces will be made in a subsequent section of this thesis.

Finally, the importance of the relationship between the U.S. and Canada makes NORAD an excellent vehicle for bi-national MHLS/MHLD coordination. Dozens of practical reasons for bi-national cooperation present themselves when reviewing the challenges of MHLS and MHLD. These will be delineated at length in subsequent chapters of this thesis. Beyond these practical factors, a strong, durable U.S.-Canadian partnership is vital to both nations, politically, economically, and culturally. Despite publicized and politicized differences, there are few nations with more in common or greater common interest than Canada and the U.S. NORAD embodies the military aspects of this special relationship in significant ways. It is a trusted and recognized organization and is well suited to be the foundation for new and greater cooperation. By not fully leveraging NORAD in this way, the U.S. would be squandering a valuable opportunity to demonstrate the value of this partnership with Canada while better providing for its national security. Canada would be passing by a superb chance to shape and influence U.S. policy, strengthen a critical partnership, and buttress their own national security and sovereignty.²⁵

²⁵ Some experts warn the opportunity for Maritime NORAD have more than just a warning function may already be past. Dwight N. Mason, "Transformation & Technology: A Canadian Maritime Security Perspective," a paper presented at NORAD and the Maritime Defense of North America (Dalhousie University, 15-17 June 2006, <http://centreforforeignpolicystudies.dal.ca/pdf/msc2006/Mason.pdf>. (accessed 20 February 2007), 3. Established in 2003, Public Safety and Emergency Preparedness Canada is Canada's counterpart to the U.S. Department of Homeland Security.

III. MARITIME HOMELAND DEFENSE AND MARITIME HOMELAND SECURITY: TWO SIDES OF THE SAME COIN

Today those defending and securing the American homeland use definitions of homeland defense and homeland security that seem clear and, on the surface, easily discerned from one another. *The National Strategy for Homeland Security*, promulgated in July 2002, defined homeland security as, “a concerted national effort to prevent terrorist attacks within the United States, reduce America’s vulnerability to terrorism, and minimize the damage and recover from attacks that do occur.”²⁶ *Joint Publication 3-26, Homeland Security* defines homeland defense as, “The protection of US sovereignty, territory, domestic population, and critical infrastructure against external threats and aggression or other threats as directed by the President.”²⁷ Homeland security entails law enforcement action that is intended to deter and detect people and activity that could indicate terrorist plots aimed at the United States. This is “cop on the beat” work and includes patrolling and screening vessels, vehicles and aircraft. It also includes scrutiny of the people and cargo they carry. Integral to these efforts are administrative measures such as the required filing of commercial aircraft flight plans, commercial vessel advanced notices of arrival, and inspection of critical transportation and industrial infrastructure. Homeland defense is rather more offensive or forward in nature and entails the destruction of easily identifiable aggressive forces threatening the homeland such as intercontinental ballistic missiles, hostile aircraft, and rogue vessels. It might also include proactive overseas actions such as operations supporting the Proliferation

²⁶ The White House, *The National Strategy for Homeland Security* (July 2002), 14.

²⁷ The Joint Chiefs of Staff, *Joint Publication 3-26, Homeland Security* (2 August 2005), 14.

Security Initiative.²⁸ Simply put, the difference between homeland security and homeland defense is the difference between law enforcement and warfighting.

However, when applied practically to the maritime domain, the differences between homeland security and homeland defense become less sharp. Even more, the distinction between the two threatens our effectiveness in protecting the North American homeland. Current management of MHLS and MHL D leaves gaps in terms of both command and control and the availability of ready response forces. Key documents such as *The National Defense Strategy of the United States of America*, *The National Strategy for Maritime Security*, and the *National Plan To Achieve Maritime Domain Awareness* underscore the importance of “an active, layered approach to...defense,” “scalable layers of security to prevent a single point of failure,” and “active, layered maritime defense in depth.”²⁹ Without integrated command and control and designated ready defense forces, the last layer of homeland defense does not exist and these are simply good intentions, not national strategy. The U.S. and Canada need to treat the MHLS home game and MHL D away game together in terms of both command and control and response operations. Maritime NORAD should be the place these efforts are unified.

The Home Game vs. the Away Game

In approaching MHLS and MHL D the common wisdom between the U.S. Navy and U.S. Coast Guard has been the Navy plays the away game, destroying the nation’s enemies far from the homeland, and the Coast Guard plays the home game, conducting

²⁸ The Proliferation Security Initiative is a collaborative interagency and international effort to stem the spread of WMD.

²⁹ The Department of Defense, *The Defense Strategy of the United States of America* (March 2005), iv; The White House, *The National Strategy for Maritime Security* (September 2005), 13; and The White House, *National Plan To Achieve Maritime Domain Awareness* (October 2005), ii.

the daily law enforcement and security operations integral to homeland security. Of course, the two services support one another as needed in both missions with ships, aircraft and special capabilities. Coast Guard cutters, port security personnel and boarding teams work with the Coalition Force Maritime Component Commander in the Arabian Gulf, just as Navy aircraft and surface combatants from Second and Third Fleets figure into the force package for protection of domestic ports when maritime security levels are raised in the U.S. homeland. The problem with this approach is the transition between MHLS operations and MHLA operations at home is nebulous, variable, and can happen very rapidly. As one senior Coast Guard officer put it:

Homeland security and defense in the maritime environment...are difficult missions to separate. Unlike in the domestic (landside) environment, the maritime arena is one in which the boundary can shift depending on the threat. For example, suppose authorities discover a plot to detonate a weapon of mass destruction in a major U.S. seaport. Suppose further that this weapon is on board a container ship currently at sea and bound for that seaport. How should this threat be classified? Is it a matter for homeland security or for homeland defense? Does it begin as a defense mission and transition to a matter of homeland security, or is it the other way around? Is there a geographic point at which the transition would occur? How exactly would the transition occur? To a large extent the Navy and the Coast Guard understand their missions at the extremes. Forward projection, 200 nautical miles from the U.S. and beyond, intuitively belongs to the Navy. The Coast Guard for its part “owns” the ports and navigable waterways of the U.S. out to 12 nautical miles. In between, though, is a large expanse of coastal waters that remain in question. Is patrolling these U.S. coastal waters a Coast Guard or Navy mission, or is it somehow shared?³⁰

In many ways the scenario presented above is easier to deal with than most, since the vessel believed to be carrying the weapon of mass destruction (WMD) is out at sea, possibly giving commanders the luxury of both time and distance to react. Often

³⁰ Peter V. Neffenger, “Merging the Missions: Ensuring Maritime Homeland Security and Defense Through Effective Command and Control” (Joint Maritime Operations paper, Naval War College, 16 May 2003), 8.

maritime threats to the homeland are all lumped in this easier to manage category. What if the threat is onboard a vessel that is nearer the coast or already in port?

Instant Threat: An Inport Activation of the Ship Security Alert System

The Ship Security Alert System is a new capability that was developed to help enhance security aboard select commercial vessels. When activated, the system notifies a vessel's flag state that the security of the vessel has been threatened or compromised by violence. Carriage of the Ship Security Alert System is currently being phased in and is required by the International Maritime Organization for all commercial vessels greater than 300 tons and for some smaller vessels carrying passengers near international borders or in specialized service.³¹ For all U.S. vessels anywhere in the world, the security alarm goes to U.S. Coast Guard Pacific Area in Alameda, California, for initial evaluation, notification, and action. Current guidance gives the Coast Guard operational commander no more than fifteen minutes to vet the alarm and determine its validity before initiating response operations.³² Whether the originating vessel is a gasoline tanker or a sightseeing boat, a whole host of possible scenarios come into play. If this alert is not quickly resolved as a technical malfunction, test or accidental activation, the event moves across the MHLS-MHLD continuum very rapidly and increasingly looks like a defense situation. Place this alert in an important economic or military port such as New York or

³¹ International Maritime Organization, "New Chapter XI – 2 (Special Measures to Enhance Maritime Security)," Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974 (9-13 December 2002).

http://www.imo.org/Safety/mainframe.asp?topic_id=583&doc_id=2689 (accessed 1 October 2006).

³² This timeframe is driven in large part by reporting requirements laid out in U.S. Coast Guard, *Critical Incident Communications*, Commandant Instruction 3100.8 (4 January 2005).

San Diego and a serious terrorist situation may exist in the homeland, developing to a critical level with almost no warning.

A recent Ship Security Alert System activation in a U.S. West Coast port, though eventually confirmed to be a technical malfunction, starkly illustrated this fast developing threat.³³ Coast Guard Pacific Area received the security alarm from a sightseeing boat while the responsible Coast Guard Sector was simultaneously managing the escort of a high value naval vessel and responding to the port call of a foreign-flagged vessel of interest with crew list discrepancies.³⁴ Local MHLS forces and commanders were already fully occupied and now had an unknown threat to investigate. This confluence of events had many of the hallmarks of a developing terrorist situation. Though all the ambiguities were resolved and deemed to be non-threatening within thirty minutes, the incident demonstrated both the vulnerability of U.S. ports to threats developing within the harbor itself and the short time commanders are afforded to evaluate a threat and initiate response. Incidents like this demonstrate that the distance and time believed to exist between the MHLS home game and MHLA away game has been eliminated. Separate treatment of MHLS and MHLA command and control creates avoidable gaps. Integrated command and control provides the best chance of success in defeating maritime threats to the homeland and will facilitate rapid and effective response to attacks that have already occurred.

³³ The author served as the first level of operational oversight for this incident while assigned to the Pacific Area Command Center.

³⁴ Sectors are the field level Coast Guard commands responsible for all operations in a given region. They are usually centered on major ports such as Sector New York or Sector San Francisco. The sector command center is the unit's command and control node and in many locations brings together local and regional partners with interagency watchstanders and liaisons.

The Rapid Transition to Defense

Besides the examples of the container vessel at sea carrying a WMD and the Ship Security Alert System activation in port, a wide variety of other events and indicators in the maritime domain act to blur the difference between MHLS and MHL D. Even if a rogue vessel or ship displaying anomalous behavior is discovered at the sea buoy or pilot station while entering a port, it is usually only an hour or two from being moored pierside. Commonly, this mooring is in the midst of a bustling port facility along the waterfront of a major city such as Los Angeles, Charleston, or Halifax. These high density metropolitan environments pose inviting targets to terrorists and are challenging areas for both security and defense operations. Liquified petroleum gas (LPG) or liquified natural gas (LNG) carriers and terminals, as well as break bulk freighters are all potential targets of terrorist activity. Small boats loaded with explosives such as those that attacked the USS *Cole* and French tanker *Limburg* in the Middle East illustrate another threat providing little opportunity for evaluation and minimal reaction time. Likewise, the activation of a radiation pager carried by a Customs and Border Protection or Coast Guard boarding team is likely an indication that a vessel is carrying harmless ceramics with a slightly higher than normal background radiation level, but it could also indicate a WMD is aboard and in the port.³⁵ Attacks on critical infrastructure and the use of mines by terrorists also represent asymmetric threats that require the immediate action of defense assets in areas where speed and precision are paramount. As represented by the MHLS-MHL D Continuum pictured in Figure 2, all of these examples serve to

³⁵ Another lesson in MHLS/MHL D was the realization by both Customs and Border Protection and the Coast Guard of just how many legitimate and safe cargoes ranging from ceramics and gauges to blueberries can have a radiation profile that is higher than normal background and, thus, alert the radiation pagers carried by boarding teams. The vast majority of radiation alerts are determined to be innocuous, but need to be quickly and vigorously investigated to assure this.

Guard, and civilian agencies in the homeland. The Department of Homeland Security and Department of Defense will still fill their respective roles in formally declaring homeland security and homeland defense events. Rather, this is about getting the right command and control players together as a matter of normal operation so they are familiar with one another and able to deal with maritime threats as they develop. The plans, chiefly the Maritime Operational Threat Response (MOTR) plan, and memoranda of agreement that currently exist for mutual support and transitioning responsibility from MHLS authorities to MHLA are appropriately non-specific.³⁶ As the Chief of Command, Control, Communications, Computers, Information, Surveillance & Reconnaissance for Coast Guard Pacific Area put it:

MOTR strives to bridge the divide by establishing processes and procedures for the key HLS/HLD stakeholders to rapidly decide not only the domain [MHLS or MHLA] the event falls into, but the lead agents for developing a response. To ensure that rapid decision making is possible within this forum, all the entities forming the MOTR decision making process must be engaged and situationally aware of events in both domains.³⁷

These details of maritime domain awareness and coordination demand the responsible agencies and military services routinely work together in a joint, interagency and bi-national environment. There is no single organization that works to integrate these processes, particularly in bringing aboard key civilian agencies above the tactical level.

³⁶ U.S. Department of Defense and U.S. Department of Homeland Security, Memorandum of Agreement Between the Department of Defense and the Department of Homeland Security for the Inclusion of the U.S. Coast Guard in Support of Maritime Homeland Defense (Undated); U.S. Department of Defense and U.S. Department of Homeland Security, Annex A to Memorandum of Agreement Between the Department of Defense and the Department of Homeland Security for the Inclusion of the U.S. Coast Guard in Support of Maritime Homeland Defense (Undated); and The White House, *Maritime Operational Threat Response For The National Strategy for Maritime Security* (October 2005). These MOUs and this plan outline in broad terms how the Navy, Coast Guard and other responsible departments and agencies will coordinate when maritime threats to the homeland are detected.

³⁷ Robert E. Day, CAPT, U.S. Coast Guard, Coast Guard Pacific Area Chief of Command, Control, Communications, Computers, Information, Surveillance & Reconnaissance, Interview by author (03 October 2006, via e-mail, author's holdings).

This lack of unity of effort was recently highlighted by a reporter from *The New York Times* when he wrote, “Unlike the relatively unified command over the nation’s skies, control of the waterways and coasts [in the U.S.] is divided among at least 15 federal agencies, which sometimes act more like rivals than partners.”³⁸ The U.S. and Canada cannot afford to risk their national security by betting that “just in time” cooperation or even local arrangements based on memoranda of agreement can effectively direct the response to maritime threats that transition between the defined bounds of MHLS and MHL D.

The command and control problem is being managed at numerous locations in the U.S. and Canada including NORTHCOM, Canada Command, U.S. Navy Fleet Forces Command/Second Fleet in Norfolk, Navy Third Fleet in San Diego, U.S. Coast Guard Atlantic and Pacific Areas in Portsmouth, Virginia, and Alameda, California, and Canadian Joint Task Force – Atlantic in Halifax, Nova Scotia, and Joint Task Force – Pacific in Esquimalt, British Columbia.³⁹ In addition the Public Safety and Emergency Preparedness Canada, Canada Border Security Agency, U.S. Customs and Border Protection and numerous state, provincial and local agencies are working their pieces of this vast maritime puzzle. Closer working relationships between the U.S. Navy, Canadian Maritime Forces, and the U. S. Coast Guard have already resulted in closing much of the MHLS-MHL D seam, but more needs to be done. There is no single organization that works to integrate these processes, particularly in bringing aboard key

³⁸ Eric Lipton, “Efforts by Coast Guard For Security Fall Short,” *The New York Times* (30 December 2006) A 14.

³⁹ Narrow portions of the maritime warning mission and regional command and control of the response mission are being handled at each of the organizations listed. Fleet Forces Command/Second Fleet serves as NORTHCOM’s naval component commander and manages MHL D issues with its Joint Maritime Forces Component Commander (JFMCC).

civilian agencies above the tactical, port level. Maritime NORAD has the opportunity to play an invaluable role in binding together these efforts and closing this critical command and control seam at the operational level.

Designated Ready Forces Are Needed

The specialized military capabilities required to respond to serious security or defense events are not easily accessible at most North American ports. In the maritime domain there are plenty of lower end platforms and capabilities at the ready for MHLS operations. However, neither the U.S. nor Canada have high end defense assets, such as aircraft with anti-ship capability, ships with the combat power to stop large vessels, mine counter measures vessels, or maritime boarding teams trained for opposed operations that are ready at a moment's notice. For example, U.S. Navy mine countermeasure vessels are centralized in Ingleside, Texas. Plans to split up the mine countermeasures fleet between San Diego and Norfolk will improve this situation, but still leaves numerous critical ports two or more steaming days away from this key capability. Aviation assets utilized for mine detection and sweeping, while more widely dispersed throughout the nation, are not necessarily maintained in a ready status while at home in the U.S. or Canada. Likewise, military explosive ordnance disposal units are often deployed and are not uniformly ready to respond to short notice requests for assistance. Threatening vessels may move more slowly than similarly threatening aircraft, but then so do the ships and small boats that would respond to such threats. If ready aircraft are not trained for anti-ship missions or do not have the right ordnance packages readily available, their fast response will be insufficient. All these examples and issues reveal the distinction

between MHLS and MHL D is largely academic and for operational purposes should be eliminated. They also point to the need to maintain a broad spectrum of ready capabilities in the homeland. Clearly, U.S. and Canada forces and special capabilities cannot be positioned to protect all ports all the time. A certain amount of risk must be assumed and managed and forces poised to respond to the ports and regions posing the greatest vulnerability and risk.

In preparation for high threat MHLS and MHL D situations, U.S. and Canadian forces have exercised their coordination and response through a number of exercises such as Exercise NORTHERN EDGE in Alaska and many smaller exercises responding to rogue vessels, terrorist mining of ports, and situations requiring non-compliant or opposed maritime boarding capabilities. These exercises have demonstrated great progress in command and control between the U.S. Navy, Coast Guard and Canadian forces. MHL D interoperability, communications, and coordination between U.S. and Canadian military forces have been exercised to the extent that this relationship can be expected to work in a real world situation. On the other hand, these exercises also further underscore the need, unless the U.S. and Canada are willing to risk a spectacular MHL D failure, to dedicate more capable ready resources to the MHLS/MHL D fight.⁴⁰ Specialized weapons platforms and capabilities were usually prepositioned for exercises and, thus, far more ready and accessible than they would normally be in day to day operations. Exercise scenarios also tend to be slower developing than would be expected in the real world. These are significant artificialities and can give MHLS and MHL D

⁴⁰ The author participated in or observed the command and control processes of numerous MHLS-MHL D exercises involving the U.S. Navy, U.S. Coast Guard, Canadian Forces and civilian agencies between 2003 and 2006.

commanders, service chiefs, and the national command authorities a false sense of security.

With the realization that MHLS and MHL D are inseparable for operational purposes and threats are faster developing than widely supposed, it is clear the maritime domain does not buy as much time to plan and execute a response as many experts assume. Homeland defense in the aerospace realm has fighter aircraft and missile defense systems ready and waiting at all times for NORAD's warning and direction through their operational commanders. As discussed in the previous chapter of this thesis, these aircraft are directly controlled by NORAD through the 1st Air Force at Tyndall Air Force Base in Florida. In preparing for maritime contingencies, NORTHCOM and Canada Command need to follow this example and require force providers to have the right capabilities ready for maritime threats to North America at all times. Unless the seaborne threat is hundreds of miles away from the homeland, response time needs to be measured in minutes, not hours.

IV. MARITIME DOMAIN AWARENESS: THE KEY TO MARITIME WARNING

Perhaps the greatest challenge to successful MHLS and MHLA is defining the requirements of maritime domain awareness (MDA) and then achieving this expansive goal. The *National Plan to Achieve Maritime Domain Awareness*, promulgated in October 2005, charted a course for the achievement of MDA in the U.S. In that strategy document, MDA is defined as, “the effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of the United States.”⁴¹ MDA is also directly referenced by U.S. leadership as “a key component of an active, layered maritime defense in depth.”⁴² While acknowledging that MDA is an American generated concept developed to counter the insecurity brought about by 9/11, its principles are equally applicable to Canada’s maritime domain and improving Canadian maritime security. In fact, it would be difficult to differentiate between U.S. and Canadian maritime activity because of shared waterways like the St. Lawrence Seaway and Great Lakes and shared access routes like the Strait of Juan de Fuca leading to Vancouver, British Columbia and Puget Sound in Washington. As Figure 3 illustrates, the large majority of vessels from Japan, Korea, and China bound for West Coast ports in either Canada or the U.S. pass through or near the Aleutian Islands while traveling on the Great Circle Route. The same can be said for vessels bound for U.S. East Coast ports originating in Europe passing near Newfoundland or Nova Scotia. The Canadian Standing Senate Committee on National Security and Defence recently

⁴¹ The White House, *National Plan to Achieve Maritime Domain Awareness* (October 2005), 1

⁴² Ibid., ii.

concluded that much work needs to be done to strengthen North American MDA.⁴³

Ultimately, as one Canadian officer serving at NORAD put it, “If two countries that have been working together for nearly half a century cannot succeed in the MDA mission, then the whole international MDA concept is doomed to fail.”⁴⁴

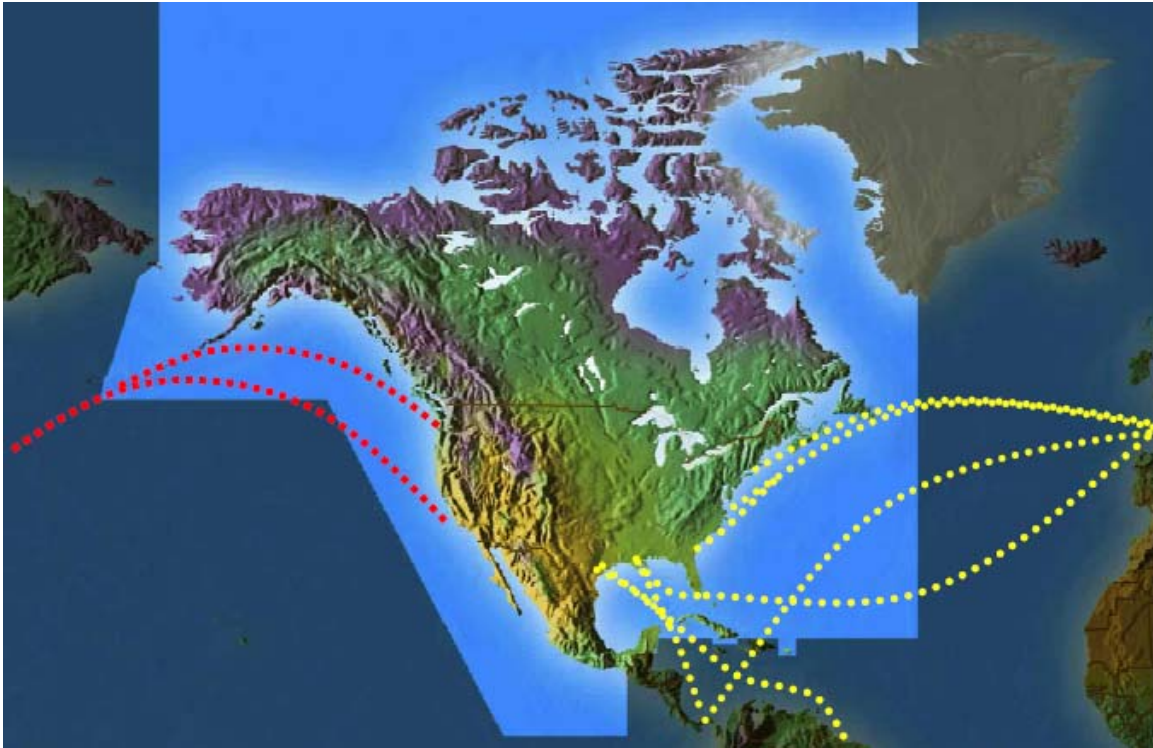


Figure 3. Maritime Great Circle Routes⁴⁵

The maritime warning mission will vault NORAD into the forefront of U.S. and Canadian MDA efforts. NORAD is uniquely positioned to make this effort succeed and, with necessary leverage from NORTHCOM and Canada Command, can play a critical role in clearing numerous technical, procedural, and coordination obstructions to

⁴³ Hogan and Baker, 73.

⁴⁴ Wayne R. Krause, LCol Canadian Forces, NORAD Maritime Initial Planning Team, Interview by author (23 October 2006, via e-mail, author's holdings).

⁴⁵ Bi-National Planning Group, The Final Report on Canada and the United States Enhanced Military Cooperation (Peterson AFB, CO, 13 March 2006), C-9.

strengthening bi-national MDA. As the Bi-National Planning Group, chartered at Peterson Air Force Base in Colorado Springs in late 2002 to study U.S.-Canadian defense relationships, framed the issue broadly:

Intelligence and information sharing are of critical importance to the combined defense and security of Canada and the United States. The awareness of the threat changed dramatically after the attacks of 9/11, hence intelligence and information sharing within and between Canada and the United States needs to be systematically codified in order to enhance awareness of potential threats to the security of either nation.⁴⁶

Working with and through key intelligence partners to identify, collect, and assemble the diverse pieces of maritime intelligence from myriad U.S., Canadian, and international sources must be one of the central goals of maritime NORAD. However, MDA is more than just maritime intelligence. The primary task in completing MDA will be integrating the intelligence picture with daily activities and events to create a composite picture of the maritime domain. Essentially, NORAD needs to synchronize these broad MDA efforts. Once that is achieved, NORAD can work with all its partners to tag unusual activity, identify potential threats, and issue warnings.

Fortunately for NORAD and the maritime warning mission, a great deal of work has already taken place in the Navy, Coast Guard, and Customs and Border Protection to further define and get a grasp on this exceedingly complex and challenging task. Much groundwork has already been laid in terms of bi-national maritime information sharing, also. On the other hand, no matter how it is defined or achieved, MDA's importance to maritime warning cannot be overstated. Maritime warning is doomed to failure without comprehensive MDA. For example, a Ship Security Alert System activation, such as discussed in Chapter III, occurring in isolation on a charter fishing vessel in a small port

⁴⁶ Bi-National Planning Group, 17.

merits prompt response and investigation, but may not move across the MHLS-MHLD continuum unless it is close to critical infrastructure, a large population center, or linked to intelligence. Insert the same incident into a port with a tanker currently offloading high octane gasoline or an out load at a military ocean terminal and the threat increases exponentially regardless of other context. Without full situational awareness through robust MDA, it is difficult to accurately categorize incidents like this as they occur.

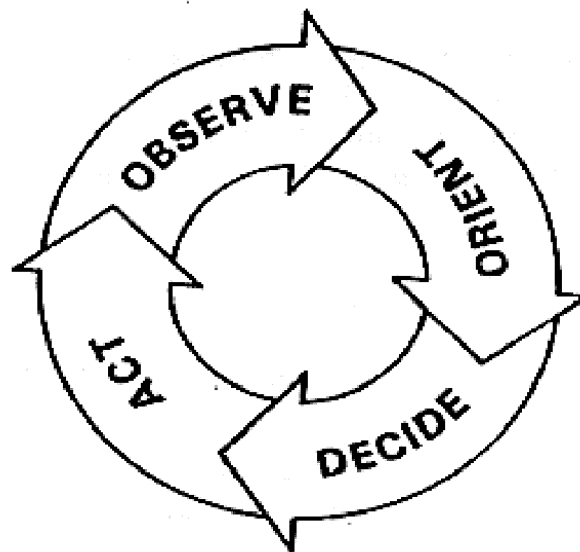


Figure 4. John Boyd's OODA Loop as Illustrated in MCDP 6⁴⁷

MDA: Observation and Orientation in the Maritime Domain

Conceptually, MDA provides the raw material for the first half of U.S. Air Force Colonel John Boyd's well known Observe-Orient-Decide-Act (OODA) loop, illustrated in Figure 4. It is sifting through thousands of pieces of data related to the maritime domain, evaluating the value of the information, analyzing the information, and

⁴⁷ U.S. Marine Corps, *Marine Corps Doctrinal Publication 6: Command and Control* (4 October 1996), 64.

determining if it indicates a threat. Then, when necessary, the next step is passing the digested information in the form of a warning along to operational commanders who will decide on and execute a course of action, completing the second half of the OODA loop. The *National Plan to Achieve Maritime Domain Awareness* identifies ten broad categories of information that need to be integrated for MDA. These include information relating to vessels, cargo, crews and passengers, areas of interest, ports and facilities, environmental data, critical infrastructure, threats and activities, friendly forces, and financial transactions.⁴⁸ This is the information that must be collected, or observed, and then oriented in order to determine the existence of threats so maritime warnings can be issued to operational commanders.

MARITIME WARNING >>>>>>MHLS/MHLD OPERATIONS			
OBSERVE	ORIENT	DECIDE	ACT
Raw Intel. Info from patrols. Crew lists. Cargo manifests. Maritime activity Etc.	Analyzed Intel. Digested & Fused Information. Integrated MDA & Warning to operational commanders...	Course of action determined by DHS, NORTHCOM, and/or Canada COM	Threat investigated and/or neutralized
MHLS/MHLD Partners	Maritime & Intel partners & NORAD	Civilian & Military Leadership	Operational Forces

Figure 5. MDA--Maritime Warning OODA Process

⁴⁸ *National Plan to Achieve Maritime Domain Awareness*, 9.

Naturally, the key to MDA and successful maritime warning is creating the best possible picture of maritime activity and then rapidly analyzing it for indications and warnings within the context of current intelligence. Boyd's original concept was developed to illustrate the intellectual process that fighter pilots must master with speed and assurance in aerial combat. The need for quick evaluation of a maritime situation and the rapid determination of a course of action that was discussed earlier in this paper is closely related to the process that Boyd originally developed as a fighter pilot. Figure 5 provides a tabular adaptation of Boyd's familiar OODA loop to the process of maritime warning and response.⁴⁹ As illustrated in Figure 6, in the MDA integration and warning process, NORAD watchstanders must take input through the information hierarchy from data to knowledge and establish understanding. At that point indicators will point toward the existence of threats if they are present. For MHLS and MHL D, this is a task of such tremendous scope that no one person could possibly tackle it alone. Success in this endeavor will only be achieved through weaving together the information yielded by the daily efforts of all the various U.S. and Canadian MHLS/MHL D partners. Further, technical solutions and artificial intelligence will be needed to assist the NORAD maritime watch team in identifying anomalies and deviations from normal patterns of maritime activity. While the concept of MDA is fairly straightforward and simple, the information and effort required to achieve it is quite significant.

⁴⁹ While the graphic rendering of MDA as an OODA process on the previous page is the author's, credit for the concept needs to be given to Mr. Joe DiRenzo who generously discussed his ideas on the subject with the author, Joseph DiRenzo III, Coast Guard Atlantic Area Anti-Terrorism Coordinator, Interview by author (13 September 2006, author's holdings), and to Guy Thomas, "A Maritime Traffic-Tracking System: Cornerstone of Maritime Homeland Defense," *Naval War College Review* (Autumn 2003, Vol. LVI, No. 4), 145.

Naturally, not all of the Observe-Orient process outlined previously can possibly take place at NORAD in Colorado Springs. Much of this will take place within the existing organizations and processes that will feed MDA information through the U.S. National Maritime Intelligence Fusion Center (NMIC), located in Suitland, Maryland, Canadian Joint Task Force – Atlantic (Trinity), Canadian Joint Task Force – Pacific (Athena), customs, and law enforcement to NORAD. That is why integrating the vast

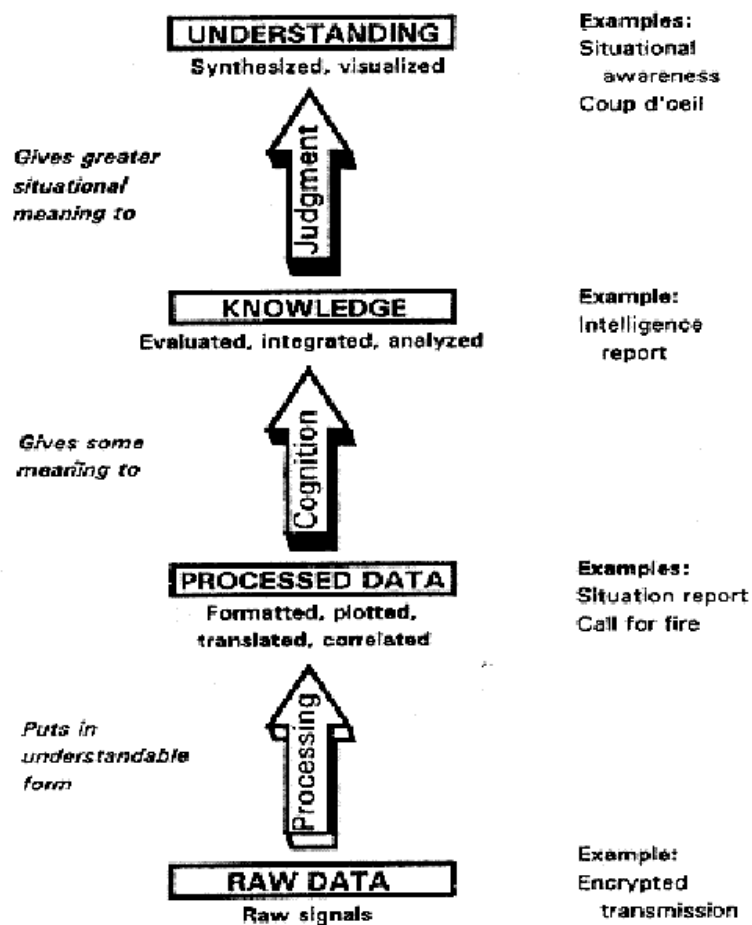


Figure 6. The Information Hierarchy as Illustrated in MCDP 6⁵⁰

⁵⁰ Marine Corps Doctrinal Publication 6: Command and Control (4 October 1996), 66.

spectrum of MDA information in one place, something that heretofore has not been accomplished, is so important to the success of maritime warning. While costly brick and mortar issues are outside the scope of this work, one would have to acknowledge the desirability of physically collocating NORAD and its key maritime intelligence partners at the NMIC, Athena, Trinity, and elsewhere. Clearly the bureaucratic hurdles and fiscal costs of such collocation would likely be prohibitive. Failing that, constant, close connectivity and virtual presence with the NMIC, Athena, and Trinity are an absolute requirement for mission success.

Maritime Intelligence and MDA

It is clear that maritime intelligence is a central element in establishing robust MDA and, thus, identifying threat indicators. The *National Plan to Achieve Maritime Domain Awareness* specifically identified the NMIC, as “the central point of connectivity to fuse, analyze, and disseminate information and intelligence for shared situational awareness across classification boundaries.”⁵¹ This combined intelligence organization, consisting of the Office of Naval Intelligence, the Marine Corps Intelligence Activity, and the Coast Guard Intelligence Coordination Center, are already primary partners with NORAD in establishing MDA and, ultimately, successful maritime warning. Naturally, parallel coordination and information sharing will need to take place with NORAD’s partners at the two Canadian Forces maritime intelligence centers, Athena on the West Coast and Trinity on the East Coast. Key partners at the operational level will include the intelligence staffs at Canada’s three regional maritime operations centers, the Coast Guard’s Maritime Intelligence Fusion Centers Atlantic and Pacific, the intelligence staffs

⁵¹ *National Plan to Achieve Maritime Domain Awareness* (October 2005), ii.

of the Navy's Second and Third Fleets, and intelligence elements within the Department of Homeland Security, Department of National Defence, and Department of Defense.

A second primary contribution of U.S. and Canadian maritime intelligence to the NORAD warning mission will be the establishment of indications and warning problems for the maritime domain. Indications and warnings are activities through which intelligence analysts detect trends, events, intentions, and the like that point toward an imminent attack on U.S. or allied interests and citizens at home or abroad.⁵² The establishment of meaningful and effective indications and warning problems is far more complex than building a simple list or definition of maritime threats. Since 9/11 a fundamental reordering of intelligence processes and indication and warning techniques has begun to take place. Shifting from a Cold War model focused on the Soviet Union to a broad, globalized approach organized to monitor and detect trans-national terrorist threats calls for wholesale changes in how Western intelligence establishments operate.⁵³ As mentioned previously, vast amounts of information will need to be examined and conclusions rapidly communicated from U.S. and Canadian intelligence centers to NORAD.

To establish effective indications and warning problems for the maritime domain, all the pieces and types of information that make up MDA need to be included. A senior Coast Guard intelligence officer contends that maritime indications and warning problems need to consider information as varied as overseas maritime attacks and threats, foreign and domestic press coverage of maritime vulnerabilities, and trends in global

⁵² The Joint Chiefs of Staff, *Joint Publication 1-02, DOD Dictionary of Military and Associated Terms* (12 April 2001), 257.

⁵³ Kenneth A. Luikart, "Homeland Security: Intelligence Indications and Warning," *Strategic Insights*, Volume I, Issue 10 (Monterey, CA: Center for Contemporary Conflict, Naval Postgraduate School, December 2002).

commodities markets in addition to unusual maritime activity, terrorism investigations, and ongoing counter-terrorism operations.⁵⁴ Since the indications and warning analysis will to a great extent take place outside of Colorado Springs in several locations in Canada and the U.S., NORAD must be granted the authority to play a leadership role in synchronizing this effort and ensuring information is shared freely and quickly among intelligence organizations. This is no small task and will require the breaking down of bureaucratic and organizational barriers in both countries.

The Common Operating Picture and MDA

In addition to maritime intelligence, the other main component of MDA is the maritime common operating picture (COP), a picture of all the current activities and events taking place in the maritime domain. Like maritime intelligence, the COP is made extraordinarily complex by the vastness of the information it entails. Also like maritime intelligence, the COP is assembled and monitored at numerous locations by a variety of players in the U.S. and Canada including the U.S. Navy, Coast Guard, Canadian Forces, and civilian agencies. NORAD's role in the COP is also parallel to its role in maritime intelligence. It is not the generator of either, but it needs to facilitate interagency and bi-national information sharing and then fuse all the data from disparate sources into a near real time picture of activity in the maritime domain that is actively monitored by NORAD watchstanders. This presents both a big leadership and technical challenge.

The maritime COP is currently a badly fragmented system of systems. Many senior leaders and laymen think of the COP and imagine a Tom Clancy movie with a

⁵⁴ Christopher J. Tomney, "Maritime Insecurity: Recommendations to Avoid Losing the War on Terrorism Along America's Waterfront," Federal Executive Fellow paper (The Brookings Institution, May 2006), 84-85.

wall-sized video display covered with hundreds or thousands of icons representing all manner of ships, facilities, and activities. Reality could not be further from this fictional image. Clearly, the unified, interactive track data base and fully developed geographic information system is where the COP should go in the future. For now, hurdles ranging from policy, protection of proprietary commercial information, cross domain information sharing, and simple data capacity prevent MHLS/MHLD practitioners from reaching this situational awareness nirvana. The challenges in reaching this goal, even at the tactical level, are legion, but progress is being made.⁵⁵

At this time, the backbone of the U.S. COP is the vessel track data base contained within the Global Command and Control System (GCCS). GCCS provides a somewhat complete picture of friendly and notable hostile and neutral vessels. Ongoing work to improve the GCCS track database by various means and manage the sheer volume of data it contains is currently being conducted at research and development facilities.⁵⁶ Beyond this existing military track database, the COP needs to integrate relevant information from the U.S. Customs and Border Protection's Air and Marine Interdiction Coordination Center (AMICC) located in Riverside, California. The AMICC conducts detailed evaluation of nearly 3,000 air and maritime tracks every day.⁵⁷ The procedures and tools they have developed in conducting their operations clearly have application in NORAD's new maritime mandate. To further enhance this collected vessel track data, the latest information from U.S. and Canadian military and law enforcement vessel boardings and maritime patrol flights also needs to be integrated in a timely manner. Databases such as the Coast Guard's Marine Information for Safety and Law Enforcement (MISLE) system

⁵⁵ Eric Lipton, A 14.

⁵⁶ Robert E. Day, Interview by author (03 October 2006, via e-mail, author's holdings).

⁵⁷ Guy Thomas, 144.

contain invaluable boarding, vessel, and facility information. Similarly, the Treasury Enforcement Communications System (TECS) used by the FBI, Customs and Border Protection and other U.S. agencies contains law enforcement information that needs to be shared with defense and security partners to complete MHLS/MHLD situational awareness. This is achievable with today's technology and primarily requires tapping into existing databases and information processes.

Information from a variety of other governmental databases represents another key component of a complete maritime COP. Perhaps most important among these is the vessel advanced notice of arrival database utilized by Customs and Border Protection and the U.S. Coast Guard. The advanced notice of arrival is filed 96-hours prior to making a U.S. port call and provides MHLS authorities information such as last five ports of call, a description of cargo, and the vessel's crew list.⁵⁸ Other important U.S. data sources include the Automatic Identification System (AIS), required for large commercial vessels by U.S. and international regulations, data from the Inland Rivers Vessel Movement Center (IRVMC) operated by the Coast Guard, and the Vessel Monitoring System (VMS), used by the National Oceanic and Atmospheric Administration and Coast Guard to track the whereabouts of certain U.S. commercial fishing vessels. Though there are technical and legal barriers to fully integrating AIS and VMS information into the COP, these can be managed and overcome. In several places data from U.S. Coast Guard and Canadian Vessel Traffic Services, organizations providing coordination akin to air traffic control for major ports, is already being entered into the COP. Driven by AIS, radar, and visual identification, the inclusion of these key data sets need to be made standard for all

⁵⁸ Requirements for the submission of advanced notices of arrival are prescribed in U.S. Code of Federal Regulations, Title 33, Navigation and Navigable Waters (2003), Part 160.206.

ports and waterways with traffic services. This information is exceedingly valuable as it both adds to the total COP and can be used to evaluate and confirm the validity of other data sources.

The COP also needs to include commercial inputs such as vessel tracking data, cargo manifests, and information on the contents and activity of industrial facilities, tank farms and pipelines that are adjacent to ports and waterways. Knowledge of the ongoing marine activities is central in determining security and defense risks and vulnerabilities in the maritime environment. While MHLS authorities already gather information on vessels carrying dangerous cargoes, similar tracking of waterside facilities is also needed. Commercial vessel tracking systems, such as those operated by the Marine Exchange of Alaska and Marine Exchange of Southern California, provide service to industry ranging from global vessel tracking to joint public-private vessel traffic services. These systems could also enhance the COP. Understandably, this is often protected or proprietary commercial information, but without it MHLS/MHLD commanders do not have an accurate picture of the maritime domain.

Information Sharing Challenges

Barriers to information sharing are a major challenge to MDA and fall into three main categories; interagency barriers, bi-national and international barriers, and the need to partner with industry. In many cases the interagency barriers are bureaucratic hurdles or stovepipes that should be swept aside or destroyed with executive or legislative direction. Internally in both Canada and the U.S., government bureaucracies often refuse to share information. This is unacceptable in the post 9/11 world. A major problem in

this fusion of MDA information is that distinctions between domestic law enforcement, military operations, and foreign surveillance are being blurred. This requires careful management to ensure the laws and constitutions of Canada and the U.S. are adhered to faithfully and the rights of U.S. and Canadian citizens are diligently protected. At the same time old paradigms may need to be broken. The global war on terror has no conveniently identified enemies flying national flags as they march into battle. Rather it is characterized by enemies who employ global commercial and financial networks and the tactics of organized crime more than hostile militaries. Military and law enforcement capabilities need to be exercised flexibly and in concert with one another despite the understandable, and frankly desirable, skepticism and scrutiny of the public.

Even after half a century of close defense cooperation through NORAD, there are still significant hurdles in bi-national and international information sharing. Much information in the U.S. that is essential in building MDA is for one reason or another classified Secret NOFORN, or not releasable to foreign nationals. Frequently the same information is held in other forms classified as Secret RELCAN, or releasable to Canada. Similarly, key Canadian information is sometimes unnecessarily classified as Secret – CEO, that is, for Canadian Eyes Only. This is often the result of people looking to avoid the personal and career risks associated with releasing classified material. U.S. and Canadian military services and intelligence agencies need to get on the same page and embrace a culture that protects vital national security information, but shares appropriate information with each other and other key defense and security allies like the United Kingdom and Australia. The shift from a “need-to-know” to “need-to-share” culture will not be easy, but is essential to future success. Of course, sharing information with

traditional, Anglophone allies is the easy part of building international security and information sharing partnerships. MDA efforts will ultimately need to incorporate close cooperation and information sharing with major trading partners and nations with large merchant marines like Japan, China, and Panama. With a trusted brand name and fifty years of experience, this is an excellent example of the sort of bi-national MHLS/MHLD effort that NORAD should spearhead.

The third main part of the information sharing challenge is building trust and partnerships with industry. Acknowledging the highly sensitive nature of commercial vessel and maritime facility information and the advantage its inadvertent disclosure could give business competitors is the first step. Communicating why the information is essential to MHLS/MHLD efforts and MDA in particular to shippers and other industry partners is the second step. While the U.S. Maritime Transportation Safety Act of 2002 and the International Ship and Port Facility Security Code placed additional requirements on maritime industry, the affected industry partners knew that compliance ensured smooth and secure movement of commerce.⁵⁹ Successful MHLS/MHLD efforts clearly benefit maritime commerce and industry as well as the U.S. and Canadian publics. NORAD, working through key interagency components like the Canada Border Services Agency, U.S. Customs and Border Protection and the U.S. Coast Guard, needs to assure industry the shared information will be protected and is key to MHLS/MHLD efforts.

The well proven AMVER system, a voluntary effort managed by the U.S. Coast Guard to assist global search and rescue efforts, may provide a model for this voluntary

⁵⁹ The Maritime Transportation Security Act of 2002, commonly referred to as MTSA, was passed in the wake of 9/11 and instituted a variety of requirements on vessels, ports, and maritime facilities to strengthen and add depth to U.S. port security efforts.

information sharing with industry.⁶⁰ In the AMVER system, commercial or national shipping concerns voluntarily populate a protected, Coast Guard managed database with information on the medical and rescue capabilities of their vessels along with the vessel's estimated position. Using this information for humanitarian purposes only, the Coast Guard can tap into the database to locate vessels that may be available to assist in search and rescue efforts. As a matter of strict policy the database can be used for no other purposes. This same sort of effort needs to be undertaken for security purposes and may actually be linked to future development of the ship security alert system, AIS, and VMS.

Unity of Effort: Synchronizing MDA

While the *National Plan to Achieve Maritime Domain Awareness* does not directly designate a lead agency to oversee U.S. MDA efforts, most of the key tasks associated with the effort fall to the Department of Homeland Security and the Department of Defense.⁶¹ The Department of Homeland Security is charged with many tasks related to the improvement of information sharing and building partnerships with industry and international organizations. The Department of Defense has a number of assigned tasks in the areas of information sharing and sensor and technology development to aid in MDA efforts. These mostly reside in areas where MDA efforts coincide with traditional military reconnaissance and surveillance efforts. Other executive departments including Transportation, Commerce, and State are also

⁶⁰ AMVER, which is no longer a meaningful acronym for anything, was started in the 1950s and includes all major U.S. flagged commercial vessels and thousands of other merchant vessels from countries ranging from China to the United Kingdom. Vessel information is available to recognized search and rescue authorities around the world through U.S. maritime rescue coordination centers to assist in the prosecution of search and rescue operations.

⁶¹ The plan designates the Maritime Security Policy Coordinating Committee (MSPCC) to oversee implementation and sets out key tasks. *National Plan to Achieve Maritime Domain Awareness* (October 2005), 18 and Appendix B.

designated MDA partners with assigned tasks. What is lacking is a single entity to unify these disparate MDA efforts.

As has been outlined, full North American MDA is exceedingly complex and involves numerous partners in the U.S. and Canadian government and private industry. Such an effort requires synchronization. *Joint Publication 1-02* defines synchronization in the intelligence context as, “application of intelligence sources and methods in concert with the operation plan.”⁶² While it is more than just intelligence, this definition works for MDA and in current Department of Defense usage gives the synchronizing organization authority to direct the action of other commands and activities to achieve operational goals.⁶³ For U.S. MHLS and MHL D efforts, the U.S. Coast Guard and NORTHCOM are the lead agents. Naturally, these two entities should partner in the synchronization of U.S. MDA efforts. As has been highlighted throughout this paper, U.S. and Canadian services and agencies need to be brought together for MHLS/MHL D under the aegis of NORAD, an idea that will be fully developed in the next chapter of this thesis. This bi-national, joint, and interagency organization would uniquely position NORAD to lead the MDA synchronization efforts of both nations. Utilizing NORAD in this role has little downside and would capitalize on an existing, trusted organization to achieve practical goals while strengthening cooperation between two key allies and neighbors.

⁶² *Joint Publication 1-02, DOD Dictionary of Military and Associated Terms* (12 April 2001), 524.

⁶³ This is much like the authority given to U.S. Special Operations Command to synchronize the activity of the other U.S. combatant commanders in the Global War on Terrorism.

V. MARITIME NORAD: JOINT, INTERAGENCY, AND BI-NATIONAL

Everyday cooperation and assistance between military services and civilian law enforcement agencies is coordinated and provided in the maritime domain. In the U.S., local police boats, Coast Guard aircraft and boarding teams, Customs and Border Protection inspectors and fast interceptor vessels are all working together to secure the maritime domain. This largely works because at the tactical level partnerships between federal, state, and local authorities and private industry existed before 9/11. This cooperation has been greatly expanded in the past five years through initiatives like area maritime security committees, bringing industry and government together, and joint harbor operations centers that create a single command and control node for multiple agencies in a port.⁶⁴ If a situation escalates from routine security to an MHLD issue, all of these MHLS players may find themselves in the midst of a homeland defense situation where NORTHCOM or Canada Command has command and control authority. These organizations and efforts ranging from MDA to response operations, need to be brought together for improved efficiency and effectiveness.

As highlighted in the preceding chapter, the establishment of North American, and eventually global, MDA will require the cooperation and synchronization of myriad military, law enforcement, intelligence, governmental, and industry partners. Beyond MDA, many organizations across multiple jurisdictions have roles in MHLS and MHLD. In the U.S. these include the Navy and the Coast Guard, the other military services, Customs and Border Protection, the FBI, and state and local authorities. In the full bi-

⁶⁴ Stephen L. Caldwell, "Maritime Security: Information Sharing Efforts are Improving," Testimony to U.S. Congress, House of Representatives, Committee on Government Reform, Subcommittee on Government Management, Finance, and Accountability, (U.S. Government Accountability Office, GAO-06-933T, 10 July 2006), 7-10.

national context these partners also include Canadian Forces, the Royal Canadian Mounted Police, Public Safety and Emergency Preparedness Canada, Canada Border Services Agency, and provincial authorities. No service or agency with responsibility for MHLS and MHL D missions has all the information or the full range capabilities and authority needed to get the job done successfully. In MHLS and MHL D, as in so many other aspects of defense and national security in the post 9/11 era, military cooperation is not enough. All elements of national power and those of allied nations or coalition partners need to be coordinated for success. This clearly points toward the establishment of Maritime NORAD as a joint, interagency, and bi-national organization to coordinate the maritime security and defense of North America.

The current planning process and initial stand-up of the maritime warning component at NORAD is essentially resource neutral and includes only U.S. and Canadian military personnel. The Canadian half of the required billets is being carved from the existing NORAD staff, while U.S. positions are being taken from existing NORTHCOM billets.⁶⁵ Both U.S. and Canadian officials and commentators, including Assistant Secretary of Defense McHale and Canadian Chief of the Defence Staff General Rick Hillier, hailed the development of a capability and structure that would be even greater than its aerospace antecedent.⁶⁶ The renewed NORAD agreement, announced in May 2006, clearly provided language to support broader MHLS/MHL D efforts in outlining the requirement to, “monitor, control, and respond to threats so that [U.S. and Canadian] security is ensured.” The renewed agreement also permits, if not mandates,

⁶⁵ Robert L. Hogan, Interview by author, (1 November 2006, author’s holdings).

⁶⁶ Aarti Shah, “McHale: ‘Maritime NORAD’ Should Be More Than Equivalent of Air Model,” *Inside the Navy*, (Volume 18, Number 23, 13 June 2005); and Barry Cooper, “New NORAD Pact Will Serve Us Well,” *The Calgary Herald*, (10 May 2006, Final Edition, Pg. A 18. <http://web.lexis-nexis.com> accessed 9 August 2006).

interagency coordination for both MHLS and MHL D when it recommends, “utilizing mutual support arrangements with other commands and agencies, to enable identification, validation, and response by national commands and agencies responsible for maritime defense and security.”⁶⁷ The rather tentative first steps in implementing Maritime NORAD would make it seem that the U.S. and Canada risk falling short of the intent of the renewed NORAD agreement and missing the great opportunity it provides.

The reality is that the U.S. and Canada are working in resource constrained times, but this does not preclude using innovative organizational models or breaking existing military command and control paradigms. In the globalized, interconnected world of the 21st century, military capabilities and organizations alone are not enough to protect U.S. and Canadian interests. The high cost of the global war on terror and non-discretionary spending, among other factors, make fiscal restraint an important guide for governments in both Ottawa and Washington. Even within these parameters, the implementation of a joint, interagency, bi-national Maritime NORAD organization can be achieved short of full physical establishment of what would amount to a permanent Bi-National Joint Interagency Maritime Task Force. The JIATF organization provides a proven model that, coupled with regionalized MHLS/MHL D command and control, will secure the maritime domain for the U.S. and Canada. Though this paper will describe a fuller organization, like that currently in place to combat drug trafficking at Joint Interagency Task Force (JIATF) South, the proposed joint, interagency, bi-national organization is scalable and can rely to a greater or lesser extent on virtual presence and cooperation.

⁶⁷ Government of the United States of America and Government of Canada, Agreement Between the Government of the United States of America and the Government of Canada on the North American Aerospace Defense Command, (28 April 2006).

The JIATF South Organizational Model

Established in 1989, JIATF South, first called Joint Task Force-Four and then JIATF East, was charged with the coordination of numerous U.S. government organizations and their effort to stop illegal drug trafficking in the Caribbean and Latin America. A subordinate command of U.S. Southern Command located in Key West, Florida, JIATF South focuses on intelligence fusion and detection and monitoring of drug smugglers in the air and sea lanes of the Caribbean, Central and South America, and the Eastern Pacific. It also coordinates patrols and logistics for forces deployed in support of the counter-drug mission. When smugglers are located and interdiction is possible, JIATF South shifts tactical control of forces to services and agencies with law enforcement authority, such as the Coast Guard and Drug Enforcement Administration, for interdiction and arrest. The official JIATF South mission statement reads:

Joint Interagency Task Force South conducts counter illicit trafficking operations, intelligence fusion and multi-sensor correlation to detect, monitor, and handoff suspected illicit trafficking targets; promotes security cooperation and coordinates country team and partner nation initiatives in order to defeat the flow of illicit traffic.⁶⁸

While counter-drug operations are a very specific mission, the general concepts behind JIATF South lend themselves very well to translation to MHLS and MHL D.

JIATF South has a fully integrated, interagency command structure. Currently, the director is a Coast Guard rear admiral and the deputy director is a Navy captain. The rest of the command cadre positions and directorate leaders are a mixture of officers from the Air Force, Marines, Army, Navy and Coast Guard as well as civilians from Customs and Border Protection, the Department of Defense, and other federal law enforcement

⁶⁸ Joint Interagency Task Force (JIATF) South, "Mission Statement," (<http://www.jiatfs.southcom.mil/> accessed 8 Nov 2006).

and intelligence agencies. If you call the JIATF South watch and talk to the command duty officer you will talk to an O-4 or O-5 level person who could be from any of the five services, or Customs and Border Protection. Other key partners such as the Drug Enforcement Administration, FBI, and U.S. intelligence agencies are represented by permanently assigned liaison officers. The key point is this organization has been successfully working for nearly twenty years and brings interagency partners together in a unified command structure rather than the typical military command with just a few interagency liaison officers. This interagency command integration fosters trust and facilitates information sharing and coordination of operational assets rarely seen in the U.S. government and could be leveraged for missions beyond stopping the illicit drug trade.⁶⁹

JIATF South is not a traditional command with normal military authorities and prerogatives. Rather, it is a U.S. Department of Defense organization with voluntary participation from interagency partners who share the common goal of stopping illegal drug trafficking. Assigned U.S. military personnel are subject to normal military order and discipline, but interagency partners are only obligated to remain invested in JIATF South as long as the command assists them in achieving individual agency goals. As such, JIATF is a kind of interagency “coalition of the willing” whose effectiveness is inextricably tied to the alignment of participating organizations in working toward success in a fairly narrow mission area. In the U.S., this type of arrangement does not lend itself to interagency cooperation in many mission areas without specific direction or

⁶⁹ James Jay Carafano, “A Better Way to Fight Terrorism,” Washington, DC: The Heritage Foundation (17 May 2005, www.heritage.org/Press/Commentary/ed05705b.cfm accessed 05 September 2006); and Richard W. Yeatman, “JIATF-South: Blueprint for Success,” *Joint Forces Quarterly* (Issue 42, 3rd Quarter 2006), 26-27.

a mandate from the President or Congress. The good news for maritime NORAD is the myriad services and agencies concerned with MHLS and MHL D have goal alignment – they are all working to secure the maritime domain of the U.S. and Canada. While an official mandate from the U.S. and Canadian governments requiring the participation of key agencies is desirable, there is good reason to believe this model will work, even voluntarily, in bringing all these dedicated partners together under the aegis of NORAD.

JIATF South, while strictly a U.S. command, also serves as an outstanding model for international operations coordination and information sharing. The command's counter-drug operations include the participation of forces from key Western allies with interests in the region including the United Kingdom, France, and the Netherlands.⁷⁰ U.S. and allied forces work together in combined force packages, covering an extensive area of responsibility and seizing far more drugs together than they could individually. A typical operation might feature a U.S. Customs and Border Protection patrol aircraft supporting a British warship with a U.S. Coast Guard boarding team onboard working inside the territorial sea of a regional partner nation to stop, board, and seize a vessel smuggling cocaine. The Office of National Drug Control Policy reports growing mission success with this approach.

Transit zone interdiction has been one of the bright spots in the national effort to stop drugs before they enter the U.S. For the third straight year, JIATF-South seized and/or disrupted a record amount of cocaine. Transit zone seizures and disruptions in 2005 amounted to 254 metric tons, compared to 219 metric tons in 2004 and 176 metric tons in 2003.⁷¹

⁷⁰ Recently Canada has agreed to join the JIATF South team by providing maritime patrol aircraft to assist in monitoring and detection efforts.

⁷¹ Office of National Drug Control Policy, Transit Zone Interdiction Operations Fact Sheet (http://www.whitehousedrugpolicy.gov/publications/international/factsht/transit_zone_interdic_op.html accessed 10 Nov 2006).

It is notable that these JIATF South cocaine seizure records were being broken at a time when fewer U.S. naval and air assets were available due to the high operations tempo associated with the Global War on Terror. These results point to the efficacy and force-multiplying aspect of the joint, interagency, and multi-national approach to operations at JIATF South.

In addition to operational cooperation, JIATF South facilitates a robust international liaison program the results in a strong information sharing effort with various partner nations in Latin America and the Caribbean. Recognizing varying levels of cooperation, participation, and closeness with these regional partners, JIATF South has developed a unique, compartmentalized information sharing regimen. Liaison officers from almost all regional nations attached to JIATF South help smooth the coordination of operations and enactment of bi-lateral agreements. The command even has a secure, but unclassified, communications link to share operational information in real time called the Cooperating Nations Information Exchange System.⁷² This system links the command centers of a host of Latin American navies, air forces, and coast guards to JIATF South in Key West and to the Coast Guard commanders in Miami, Florida, and Alameda, California, who are responsible for interdiction operations in their area of responsibility.

The JIATF South organizational framework could be effectively utilized by NORAD in establishing a joint, interagency and bi-national command to coordinate MHLS and MHL D information sharing, analysis, and command and control. NORAD

⁷² CNIES, as the system is known, includes e-mail, chat, a means to share vessel and aircraft track data packaged with a remarkably useful Spanish-English translation function to foster international information sharing. A similar, though prototype, communications system called the North Pacific Coast Guards Forum is being used by the coast guards or border guards of the Peoples Republic of China, Russia, Japan, South Korea, Canada, and the U.S. and has been tested in exercises simulating coordination in the interdiction of drug and migrant smugglers in the North Pacific.

has already mastered bi-national integration. The JIATF South model would bring key partners from Canadian and U.S. non-military agencies like Royal Canadian Mounted Police and U.S. Customs and Border Protection into the command structure. This undoubtedly will help build the trust and interagency ownership required for real information fusion and unity of effort. The information sharing and intelligence fusion model, in particular, should be looked to for guidance in establishing the maritime warning mission and a broader, comprehensive maritime NORAD. For the U.S., interagency integration at NORAD would help fill the void between agency headquarters in Washington and field level operations. For instance, Customs and Border Protection has twenty field offices overseeing 317 U.S. ports of entry.⁷³ The FBI has 56 field offices and more than 400 satellite offices.⁷⁴ Integrating Customs and Border Protection, FBI personnel, and other agencies into the maritime NORAD structure could also help provide operational level coordination in the maritime realm between the agency headquarters and tactical level field operations.⁷⁵

Perhaps the most important advantage of the JIATF model for Maritime NORAD is that it would help close the seam between MHLS and MHL D by bringing together the lead agencies and partners under one organizational roof. Rather than rely on ad hoc arrangements during times of crisis, these stakeholders will be working together all the time. As intelligence and indicators point toward various threats, meaningful planning

⁷³ Customs and Border Protection, Field Operations Offices (<http://www.cbp.gov/xp/cgov/toolbox/contacts/cmcs/> accessed 10 November 2006).

⁷⁴ Federal Bureau of Investigation, About Us - Quick Facts (<http://www.fbi.gov/quickfacts.htm> accessed 10 November 2006).

⁷⁵ The lack of operational level leadership is a key gap in homeland security. Before Secretary of Homeland Security Tom Ridge announced his resignation in late 2004, DHS was moving toward regionalization that would have provided unified, operational level command and control for the department's agencies. When Michael Chertoff succeeded Ridge, the plans were shelved and are no longer being actively considered.

and coordination can take place before a critical event occurs. When an unforeseen event rapidly begins moving from a routine security situation to a defense threat, all the appropriate services and agencies would be represented to ensure a seamless hand-off from MHLS authorities to a NORTHCOM led defense homeland operation. Just as important, if MHLS/MHLD officials are presented with a terrorist attack *fait accompli*, the bi-national, joint, interagency NORAD organization would be able to coordinate initial response and mitigation efforts and provide a smooth transition to NORTHCOM for its continued support to the Department of Homeland Security within the framework of the National Response Plan.

Applying the JIATF concept to bi-national homeland defense and security is not new or completely novel. In its March 2006 report, the Bi-National Planning Group introduced several organizational concepts for improving North American defense and security. One of these was a Continental Joint Interagency Task Force fusing bi-national defense and security shown in Figure 7.⁷⁶ The organization model proposed here is really the maritime subset of the comprehensive defense and security model proposed by the Bi-National Planning Group. Though desirable, establishing the Continental Joint Interagency Task Force may not be realistic in the short term because of fiscal, policy, and organizational culture barriers.⁷⁷ The Bi-National Joint Interagency Maritime Task Force could serve as an excellent starting point for building the Bi-National Planning Group's all domain joint interagency task force.

Finally, this organization could ultimately provide a structure for bringing our other North American neighbor, Mexico, into the maritime warning and command and

⁷⁶ Bi-National Planning Group, 40.

⁷⁷ Ibid., 41.

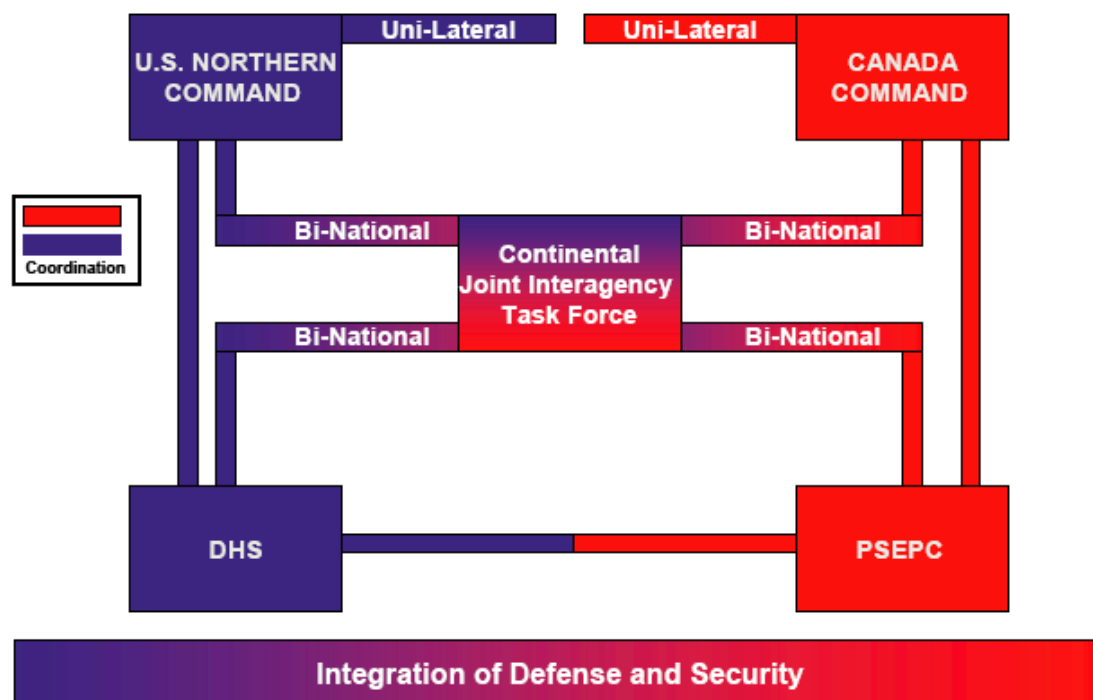


Figure 7. Bi-National Planning Group's Continental Joint Interagency Task Force Concept⁷⁸

control effort. With an inter-dependent economy, trade agreements like the North American Free Trade Agreement, growing container ports on the Pacific coast, a large commercial fishing fleet, a significant passenger cruise business, and major petroleum operations in the Gulf of Mexico, efforts to establish North American MDA and a maritime shield really cannot be complete until Mexico is brought into the U.S-Canadian partnership. Like the Continental Joint Interagency Task Force, this too may seem far-fetched today, but the JIATF South model has a solid international information sharing regimen that could bring Mexico, specifically the Mexican Navy, aboard the maritime NORAD effort in graduated stages.⁷⁹

⁷⁸ PSEPC stands for Public Safety and Emergency Preparedness Canada, the Canadian counterpart to the U.S. Department of Homeland Security. Bi-National Planning Group, 40.

⁷⁹ According to a recent CRS report, the current limited form of Maritime NORAD may be better positioned to bring Mexico into the current bi-national information sharing regime. Steve Bowman and

Command and Control Organization and Regionalization

Successful MHLS and MHL D is such a daunting task in scope and complexity that it cannot be centrally managed in a single location. One of the key lessons learned from NORAD's air defense history is the value of command and control regionalization in providing for the defense of North America. This regionalization allows NORAD to provide the appropriate level of air domain situational awareness and scrutiny of specific events. As necessary, incidents are elevated or delegated to the appropriate level for monitoring and action. This same type of command and control structure and regionalization is needed in the maritime domain.

Much of the joint and interagency framework for the regionalization of Maritime NORAD already exists and only requires coordination and synchronization. In fact, Canada has already directed significant effort toward command and control regionalization in the maritime domain. Canada is establishing three Maritime Security Operations Centers using their Joint Task Force – Pacific (Athena) and Joint Task Force – Atlantic (Trinity) maritime operations centers as foundations on the West Coast and East Coast while establishing a new operations center for the Great Lakes. These centers will fuse operations and intelligence with the Canadian military and key government agencies including the Canadian Coast Guard, Transport Canada, Canadian Security Intelligence Service, Royal Canadian Mounted Police, and other law enforcement agencies.⁸⁰

Jame Crowhurst, "Homeland Security: Evolving Roles and Missions for United States Northern Command," Congressional Research Service (16 November 2006), 5.

⁸⁰ Wayne R. Krause, Interview by author (23 October 2006, via e-mail, author's holdings).

Regional maritime command centers in the U.S. should piggy-back on existing maritime command and control nodes, with the relationship between the U.S. Navy and U.S. Coast Guard serving as the foundation. As previously noted, these two services already work closely together across the full spectrum of maritime operations at home and overseas. They bring the right mix of capabilities and authorities and provide key linkages between military and civilian forces and between the Department of Defense and Department of Homeland Security. At the tactical level, they already operate joint harbor operations centers with other key partners in places like Norfolk and San Diego. In other key military ports, local Navy and Coast Guard commands share information and jointly tackle security issues ranging from the escort of high value assets, maintenance of security zones, and security for military outloads and inloads.

Currently, the most important U.S. MHLS/MHLD coordination occurs on the East and West Coasts between the numbered Navy fleets and the Coast Guard area commands. While Second Fleet in Norfolk and neighboring Coast Guard Atlantic Area in Portsmouth, Virginia, do not share a collocated command center, they do have significant command and control ties, communications compatibility, and information sharing protocols. Similarly, Third Fleet in San Diego is closely connected with Pacific Area in Alameda, California, even conducting weekly joint operations and intelligence briefings via secure video teleconference. These partnerships are familiar, tested, and already work with the NORTHCOM Joint Operations Center and the Joint Forces Maritime Component Commander at U.S. Navy Fleet Forces Command on a daily basis. The chain of command could go directly from NORAD to regional command centers or from NORAD through Canada Command and NORTHCOM to regional command centers.

While possible reorganization of high level Coast Guard command and control may see the area commands eliminated and the existing eight Coast Guard district commands within the NORTHCOM area of responsibility adjusted to better align with key MHLS and MHLA partners, this essential basis for Navy-Coast Guard cooperation will continue to be present.

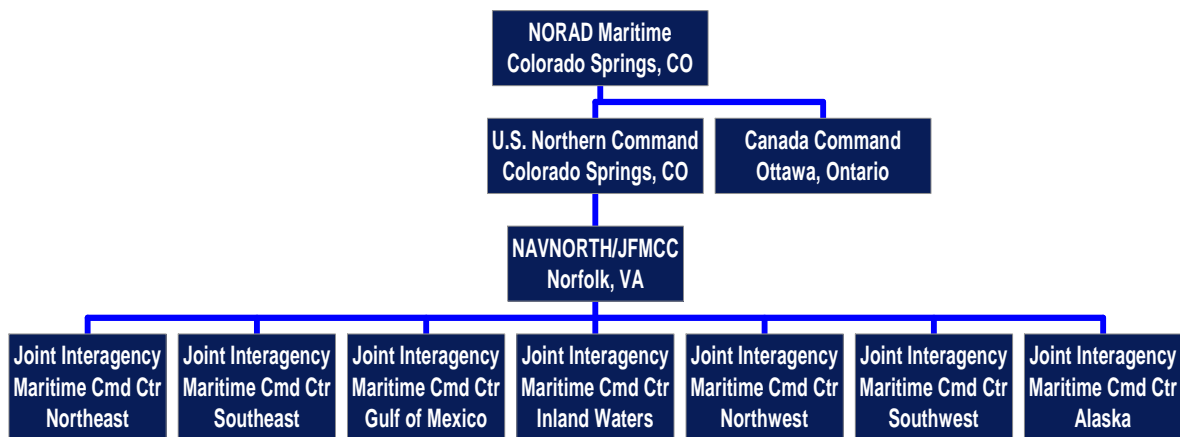


Figure 8. Possible Model for U.S. Regionalization of Maritime NORAD

Ideally, regional maritime command centers would bring the Navy and Coast Guard together physically with other key players like CBP and FBI, as well as state agencies, represented by watchstanders and liaison officers. Practically, the current virtual connectivity between the Navy's Second and Third Fleets and the two Coast Guard Areas is an acceptable starting place. However, the lack of representation from other services and agencies is a significant shortfall. Serious work needs to be undertaken to get at least Customs and Border Protection and FBI representation into this arrangement, most likely at the Coast Guard Area Command Centers or at the District Command Centers after the aforementioned Coast Guard reorganization. As Figure 8 highlights, one or more additional regional command center should also be considered to

adequately cover the coast of the Gulf of Mexico, Western Rivers, and Great Lakes. In these regions a logical starting point may be the Eighth Coast Guard District in New Orleans, Louisiana, or the Ninth Coast Guard District in Cleveland, Ohio. As long as the NORAD command and control ties remain strong, these regional centers might have proportionally less Navy representation since they are largely internal waterways.

Like other multi-tasked and multi-mission military commands, the NORAD regional maritime command centers would normally be transparent, doing the regular work the Navy and Coast Guard already does each day. Each service would work its issues with its inherent authorities and through the normal chains of command. However, when something extraordinary requiring broad multi-agency or bi-national coordination did occur, all the command and control apparatus and relationships outlined in the Maritime Operational Threat Response (MOTR) plan and discussed in Chapter III would be in place, available, and well-practiced.

Ready Forces for Maritime NORAD

While a robust, integrated MHLS/MHLD command and control system is a critical step toward securing the North American homeland, it may be powerless to protect Americans and Canadians without allocated forces. This was one of the key lessons from NORAD's air defense mission, starkly illustrated on 9/11. Just as NORAD has forces assigned to it for air defense missions through its Joint Forces Air Component Commander at Tyndall Air Force Base, a parallel force structure needs to be established for maritime defense and security. With the persistent presence in the North American maritime domain of the U.S. and Canadian coast guards, U.S. Customs and Border

Protection, the Canada Border Services Agency, and numerous local, provincial, state, and federal law enforcement and public safety agencies, the readiness and availability of lower end MHLS forces is not a significant gap. However, if NORAD or NORTHCOM and Canada Command are called on to respond to a significant defense threat in the maritime domain, forces may or may not be available, or properly trained, to perform the mission. In order to meet rapidly developing maritime threats against the homeland, four categories of forces need to be appropriately trained and held in a high degree of readiness: major surface combatants, aircraft and crews trained and equipped for maritime interdiction with anti-ship capabilities, boarding teams with enhanced capabilities, and special response units such as military explosive ordnance disposal units or U.S. Department of Energy radiation assistance teams. The challenges in this area are great because of the high military operational tempo associated with the Global War on Terror and the relatively small number of specialized units available.

Currently, in the U.S. the Navy designates a number of surface combatants as ready MHL vessels. This provides the needed capability for surge operations associated with the raising of domestic maritime security levels in response to threats or terrorist actions. These vessels, coupled with larger Coast Guard high and medium endurance cutters, would also provide the platform for boardings and the capability for offensive operations against threatening vessels conducted far offshore. Thus, the more distant maritime threat to the homeland can be met largely with existing designated forces and readiness. However, this only settles the least challenging of MHL threats. The nature of operating warships and their slower speeds makes them unlikely to be able

to respond to faster developing, near shore threats. Just as in the air defense realm, military aircraft seem to offer NORAD the best response resource.

Both the U.S. Navy and U.S. Air Force claim capabilities in maritime interdiction and attack. Both services and their Canadian counterparts need to ensure capabilities on paper translate to real world readiness. For the most part, current operations in Afghanistan, Iraq, and elsewhere do not emphasize the need to target and disable or destroy major merchant vessels. The munitions needed for such operations must be readily available and a renewed training emphasis should be placed on this mission. The interdiction and disabling or destruction of smaller, fast vessels can be carried out by fixed-wing aircraft or armed helicopters, in addition to fast patrol vessels on the surface. U.S. Navy and U.S. Coast Guard helicopter aircrews have current, applicable experience in interdicting and stopping fast vessels from drug interdiction operations in the Caribbean and Eastern Pacific. For both fixed-wing aircraft and helicopters, NORAD and the U.S. and Canadian services need to ensure this experience and capability is ready to respond to threats in the major ports of North America in much the same way that ready aircraft are designated for the air intercept mission.

Boarding and inspecting vessels at sea or in port has long been a competency of the Canadian and U.S. navies and U.S. Coast Guard. It is a skill practiced daily in naval operations directed against smugglers around the world. The new terrorist threat, however, requires the U.S. and Canada maintain readiness not just for compliant and non-compliant boardings, but for actively opposed boardings. This is the likely scenario if a terrorist operation were discovered in its last stages aboard a vessel near the coast or in a North American port. NORAD's requirement in this instance is for a ready and rapidly

transported boarding team to be delivered to a vessel, possibly in the face of hostile fire. This capability is almost certainly to come from military boarding teams, such as a U.S. Coast Guard enhanced capability Maritime Safety and Security Team, or special operations forces, such as U.S. Navy Sea, Air, Land (SEAL) teams. Conducting an opposed boarding on a ship is simply outside the scope of civilian law enforcement teams, no matter how capable they may be ashore. More forces with these capabilities need to be developed, since with the high demand of the Global War on Terror they are few and often deployed overseas.

Finally, NORAD needs to establish a readiness system that includes the specialized capabilities needed for meeting terrorist threats and rapidly mitigating the effects of successful attacks while ensuring the ability to respond anywhere in Canada or the U.S. in minimum time. The U.S. Department of Homeland Security and Public Safety and Emergency Preparedness Canada, along with the military services of both nations, need to identify and manage all relevant military and civilian capabilities. Included in this force management effort would be both military and civilian explosive ordnance disposal teams, military and civilian radiation assist teams, environmental clean-up and response specialists, and support for search and rescue, public affairs, and the like. For smaller or contained incidents, NORAD would be coordinating the operations for military or with Department of Homeland Security and Public Safety and Emergency Preparedness Canada. For a major event, NORAD's efforts would transition to efforts within the framework of the U.S. National Response Plan and Department of Homeland Security or its equivalent in Canada.

VI. CONCLUSION AND RECOMMENDATIONS

The safety and security of the North American maritime domain is essential to the wellbeing and economic prosperity of the U.S., Canada, and the rest of the world. The extraordinary size, scope, and complexity of this environment, coupled with the traditional divisions between defense and law enforcement make the task of providing effective North American MHLS and MHL D daunting. The 28 April 2006 renewal and updating of the bi-national NORAD agreement to include maritime warning provided an excellent opportunity to comprehensively address this critical area of both U.S. and Canadian national security. The renewed NORAD agreement, however, was not specific and left key questions about the ultimate scope and organization of the maritime warning mission unanswered. This very limited initial maritime effort at NORAD needs to be the start of a much larger effort to provide improved MDA, create a dependable maritime warning process, and unify bi-national maritime security and defense command and control efforts. Maritime NORAD should ultimately parallel or even surpass NORAD's historic air defense model.

NORAD's History Provides Key "Navigation Aids" for the Maritime Domain

A close, durable U.S.-Canadian partnership is vital to both nations, politically, economically, and in national security matters. NORAD has a strong foundation of almost fifty years of bi-national defense cooperation. It is a tangible manifestation of the special relationship between Canada and the U.S. This is invaluable as both a source of trust and a framework with which to build the joint, interagency and bi-national structure needed to provide successful North American MHLS and MHL D. By not fully utilizing

NORAD for MHLS and MHL D, the U.S. and Canada would be squandering an outstanding opportunity to demonstrate the value of this partnership to each other while better providing for their own individual national security. Specifically, NORAD's experience demonstrates that security threats can originate externally and internally, that command and control should be regionalized, and that ready forces need to be specifically designated for North American MHLS and MHL D.

MHLS and MHL D are Inseparable for Operational Purposes

The traditional separation between defense and security creates a seam that can be exploited by enemies in the maritime domain. Maritime threats can be fast developing and should not be expected to provide a great deal of time to plan and execute response operations. Threats from outside the U.S. and Canada, traditionally defense responsibilities, must be aggressively identified and deterred or neutralized. At the same time, the openness of the U.S. and Canada make the development of catastrophic threats within the borders, traditionally in law enforcement's purview, very possible. Unless a seaborne threat is hundreds of miles away from North America, response time needs to be measured in minutes, not hours. While higher level guidance, like the Maritime Operational Threat Response (MOTR) plan in the U.S., has been developed, the details of interagency cooperation are neither well-practiced nor widely understood by all MHLS/MHL D partners. Key partnerships need to be institutionalized and exercised regularly through NORAD, not dependent upon personalities and ad hoc relationships. MHLS and MHL D command and control needs to be integrated at NORAD or at NORTHCOM and Canada Command.

NORAD Should Synchronize North American MDA

MDA is tremendously complex and involves a variety of partners in the military, government, and private industry. It requires information sharing, cooperation, and coordination among agencies with related and often overlapping, but not identical interests, skills, and responsibilities. Such an effort requires synchronization *a la* U.S. Special Operations Command's synchronization of American efforts in the Global War on Terror. NORAD is uniquely positioned to provide necessary domain awareness leadership and synchronize the numerous MDA efforts underway in both the U.S. and Canada. Using NORAD in this role has little downside and would draw on the capital of a trusted organization to achieve this essential goal.

NORAD's Maritime Component Needs To Be Bi-National and Interagency

NORAD's history of providing aeronautical warning and command and control to the U.S. and Canada, in particular lessons learned from the 9/11 Al Qaeda attacks, demonstrates the importance of interagency and bi-national cooperation. A strong, bi-national and interagency organization is required when tackling a problem as complex as maritime warning. Just as in the aeronautical realm, North American interdependency makes maritime domain awareness and response to identified threats explicitly bi-national, if not tri-national (including Mexico). Just as important is the example provided by NORAD's close cooperation with civilian aviation partners such as the FAA and Nav Canada. The efforts of myriad civilian agencies and private industry is integral to

MHLS/MHLD success. They must be full partners in any meaningful attempt to secure the North American maritime domain.

MHLS and MHL D Command and Control Should Be Unified and Regionalized

Fast developing and cross-jurisdictional maritime threats require MHLS and MHL D command and control be unified. The minutes lost shifting the operational control and responsibility of a maritime event from one command or agency to another cannot be recouped and may well be the difference between success and catastrophic failure. Like the legacy air defense mission, MHLS and MHL D are complex and require the monitoring of high volumes of vessel traffic and related maritime activities. In order to manage this volume in the air, routine command and control functions and first level analysis of indicators and threats are delegated to the three air defense regions and further distributed to the three air defense sectors within the busy U.S. Continental Air Defense Region. Similar regionalization needs to be implemented in the maritime realm.

MHLS and MHL D Require Specified Ready Forces

In preparing for maritime contingencies, NORTHCOM and Canada Command need to follow the aerospace defense precedent and require force providers to have a broad spectrum of capabilities ready for maritime threats anywhere in North America. These capabilities should include surface and air maritime interdiction, enhanced vessel boarding teams, explosive ordnance disposal, mine counter measures, and other special response units. These readiness requirements must be formalized to ensure that U.S. and

Canadian forces are trained and equipped for MHL D/MHLS missions and do not result in a solely notional capacity to furnish these key capabilities.

Providing comprehensive MDA, effective maritime warning, and fully developing MHL D and MHLS command and control and response procedures is imperative in ensuring the future security the U.S. and Canada. These efforts can truly benefit from NORAD's half-century example of aerospace defense. Maritime warning is a good start, but, to fulfill its great maritime potential, NORAD needs to make a comprehensive maritime effort including treating MHLS and MHL D together, integrating shared MDA and warning analysis, and utilizing an interagency organization model, to coordinate operations and ensure seamless command and control.

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